

Liebherr Hydraulic pumps and motors

Versatility and Longevity



LIEBHERR

Flexibility and modular design

The modular element system used for the regulator, through drives and attachment flanges makes Liebherr's hydraulic pumps and motors exceptionally flexible and suitable for many different applications. An optimal solution can be found for every power train system.

Long life and reliability

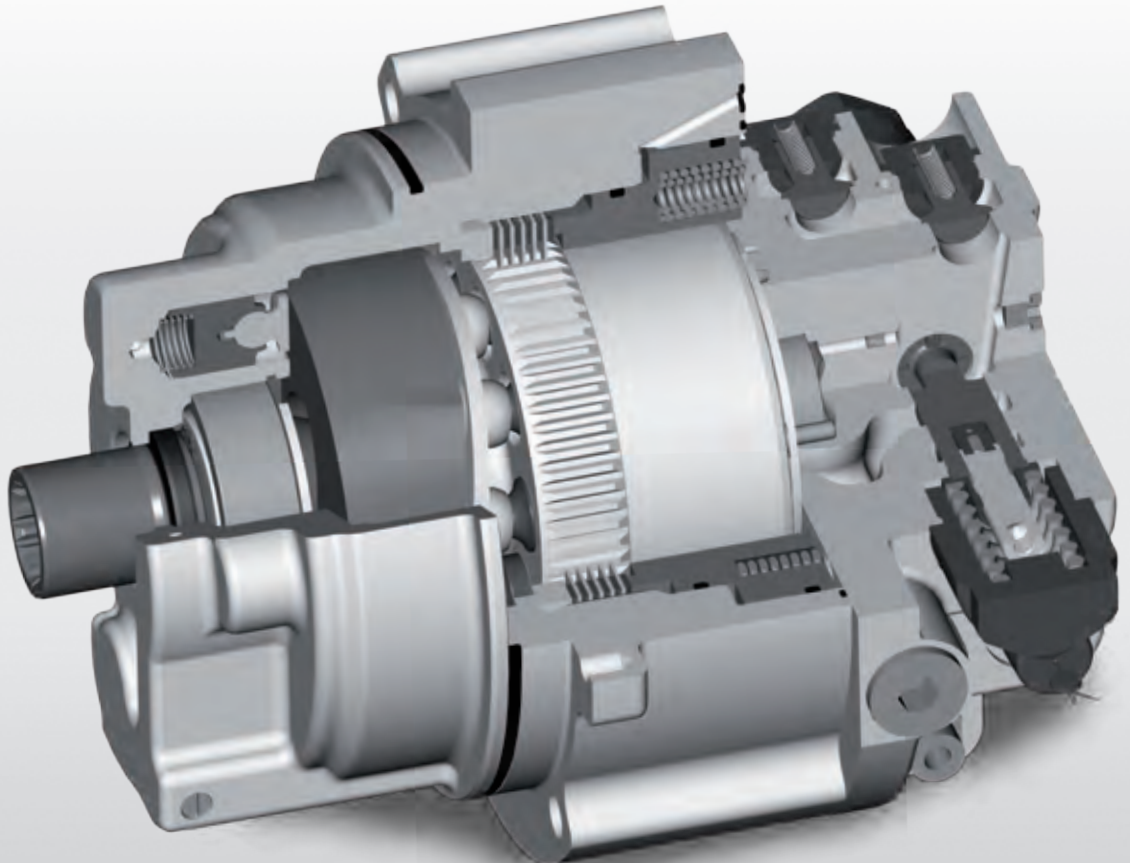
Liebherr's many years of experience and the use of the very latest technologies are factors that promote the development of all its new products. Thanks to high-strength materials and design ratings for long-term strength at high pressures, Liebherr hydraulic components satisfy the high standards demanded for modern construction machinery. Combinations of the most suitable grades of steel are a guarantee of long component life and low wear.

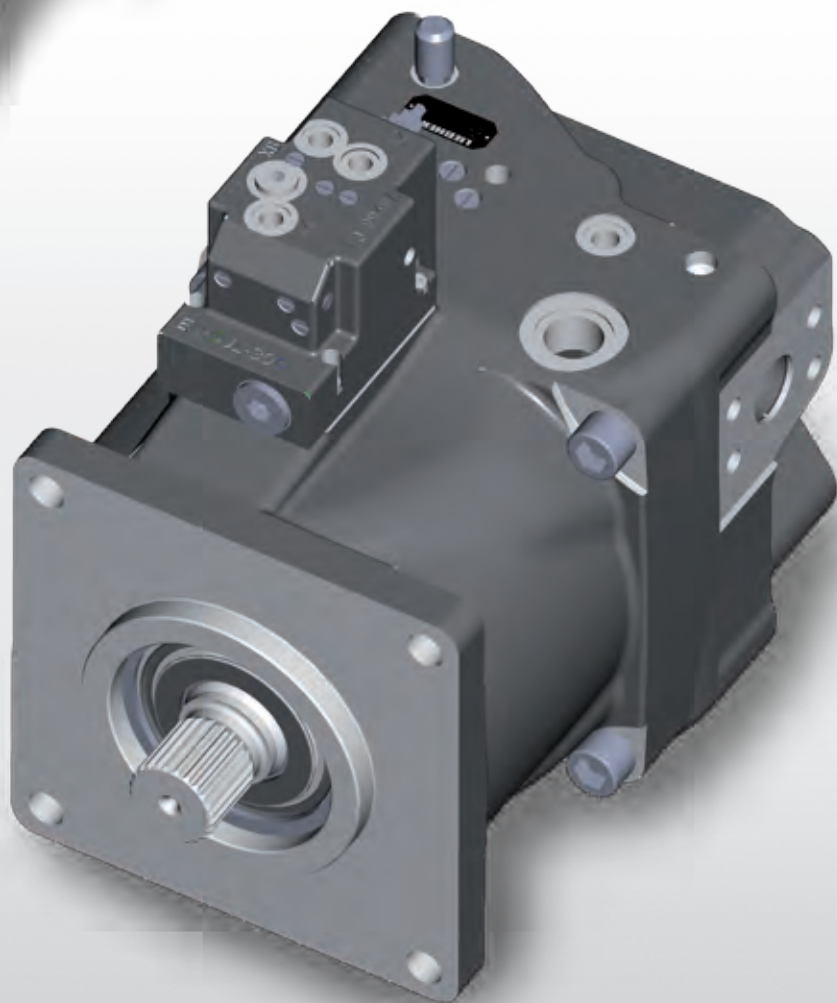
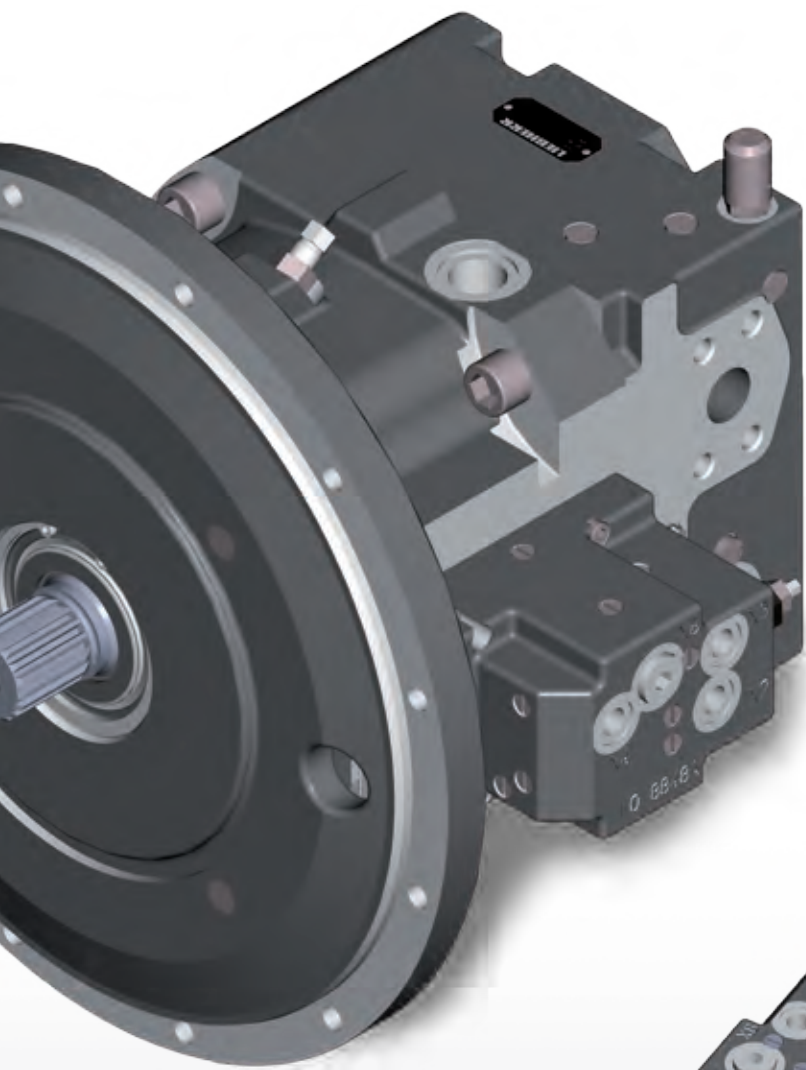
Optimised efficiency

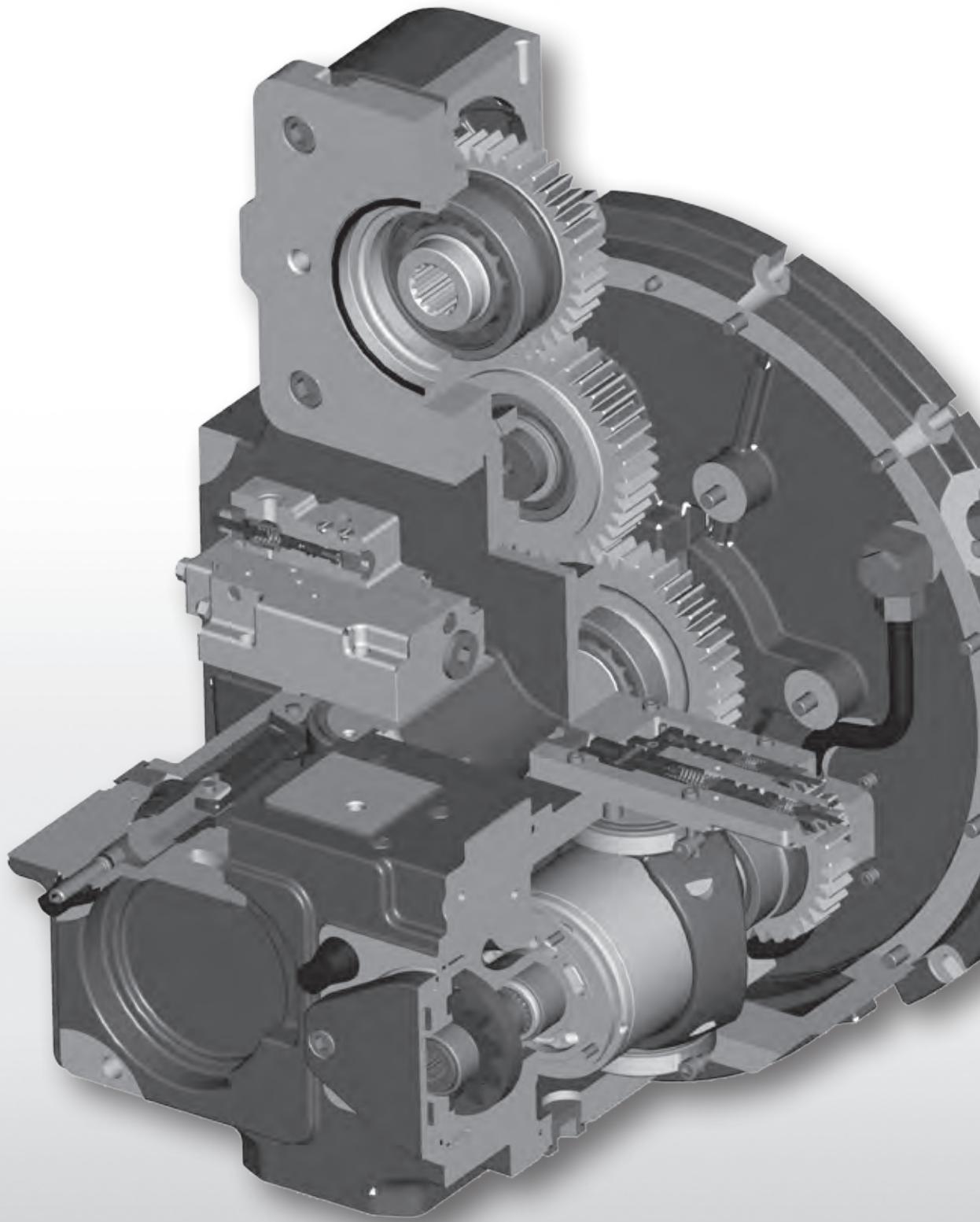
Pumps and motors owe their high efficiency to an excellent energy optimization especially in the part-load area. A high slewing angle is reached by the swash-plate units. For maximum efficiency, sliding contact points are optimised with regard to torque and flow volume. A low friction controll gives the possibility to make very accurate and precise adjustments.

Low noise

Ultra-modern development and design methods keep noise emissions from Liebherr hydraulic components down to an exceptionally low level. With the aid of modern CAE software, power units, valves and housing structures are designed and rated specifically for the lowest possible pulsations and vibrations. This prevents an excessive noise burden improves the operating confort.







The modular construction principle allows products to be matched accurately to individual needs.

Flexibility and modular design

Liebherr builds axial piston, swashplate hydraulic pumps and motors for use in open and closed circuits. Its extensive range of pumps and motors covers all hydraulic drive demands and categories in an optimal way.

In the product program:

- single, double and parallel pumps and single or double motors
- variable or constant displacement volumes
- integrated multi-output transmissions
- hydraulic motors with brake valves or integrated multi-disc brakes
- multi-purpose modular regulator system

Modular system

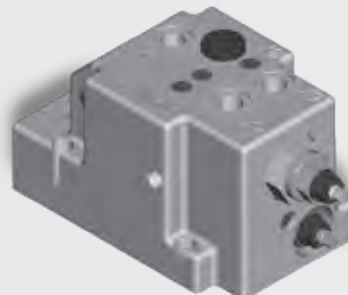
Since the product program uses a modular-element principle, it permits the use of widely varying regulators according to the requirements, as well as the use of assembling flanges and through-drives according to ISO and SAE standards.

Integrated functions

A high level of functional integration means that only a minimum of installed space is needed. This allows an accurate control as well as a smooth drive and operating comfort for the end-user of the machine.

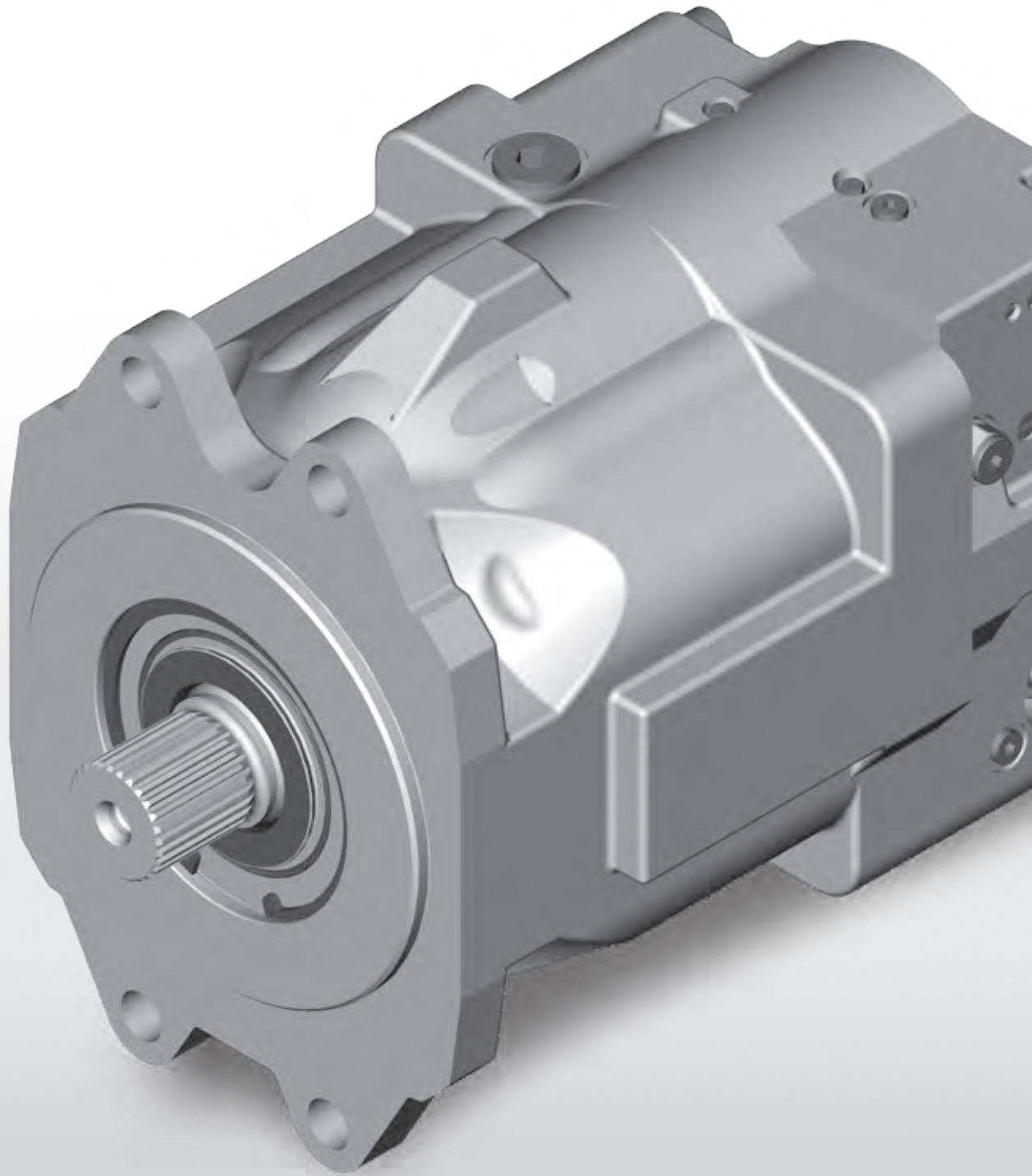


The integration of the brake valve, the holding brake and the central control unit into the hydraulic motor is an example of high functional density and low cost.



The modular regulator system permits the use of:

- power regulators
- hydraulic pressure proportional regulator
- pressure cutoff
- load sensing
- positive control
- electric proportional regulator



FE Analysis
Stress analysis of swelling joint

High longevity

At the product development stage, the foundations are laid for the high quality and performance of Liebherr hydraulic pumps and motors. Design features that have proved successful are retained and combined with new, innovative ideas.

Systematic simulation

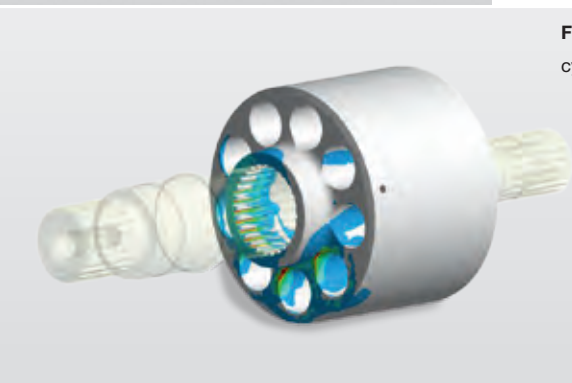
The use of modern CAE software for simulation shortens development times and results in optimal component designs.

Precision and accuracy

The very highest level of manufacturing technology ensures high-precision results.

Demanding experimental conditions

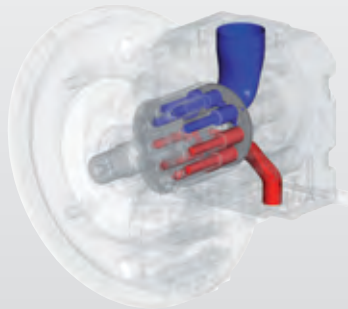
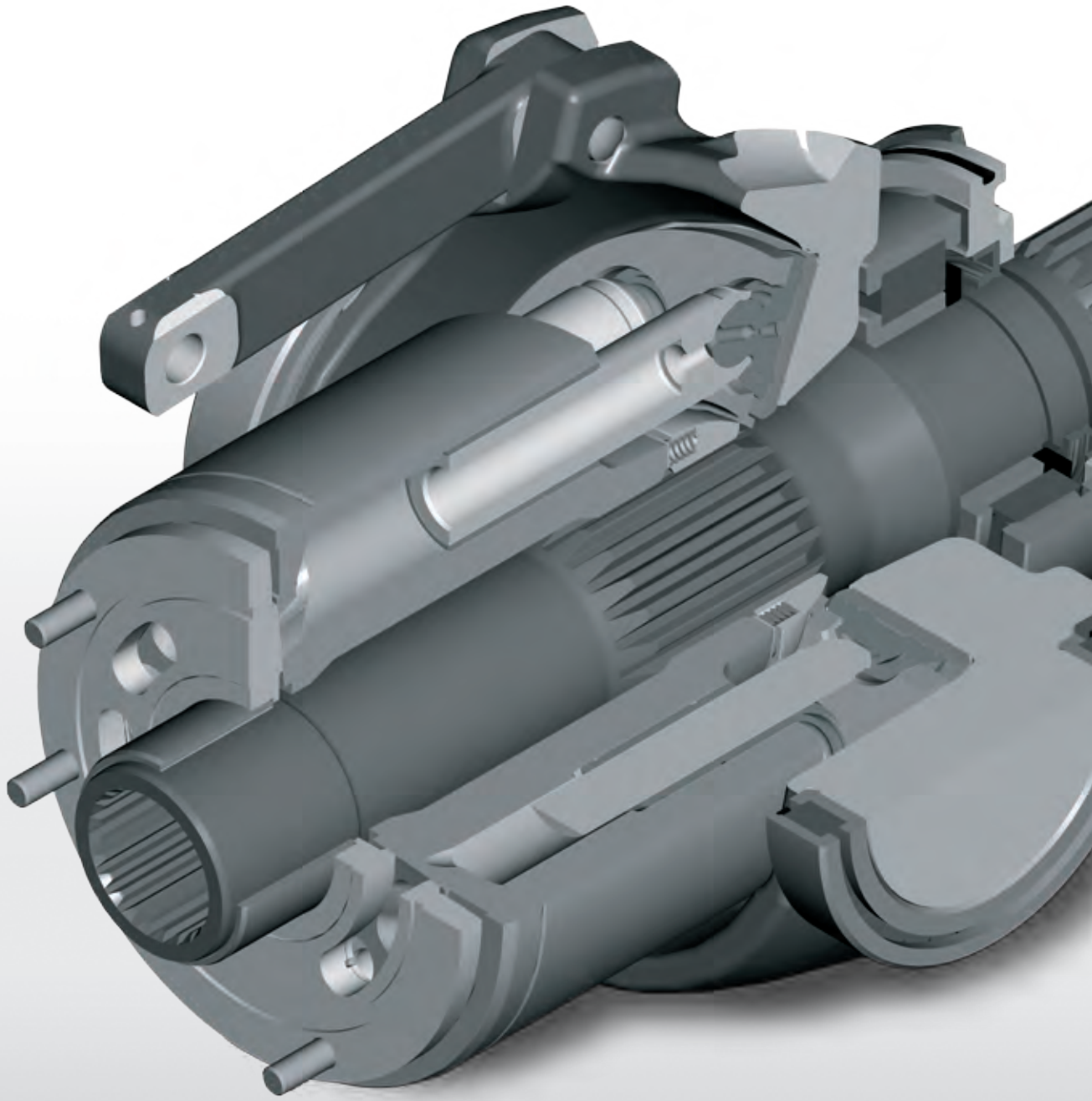
New products are not only tried out in the laboratory and on the test rig, but also optimised in practical applications. As an example, long-term tests at pressures of more than 450 bar are carried out.



FE Analysis
cylinder distortion.



Modern, flexible
manufacturing facilities.



CFD simulation

- Minimising pressure losses
- Optimised flow paths
- Increased suction limit for self-priming pumps

Optimised efficiency

Increasing the swiveling angle to 22 degrees results in higher component power density and higher power conversion with less space requirements. The units' conversion range are also higher with a better efficiency. Increasing the pressure range to 450 bar for components forming a closed circuit also boosts power density. At the same time, smaller units can be selected, which has a favourable effect on cost.

Dynamics

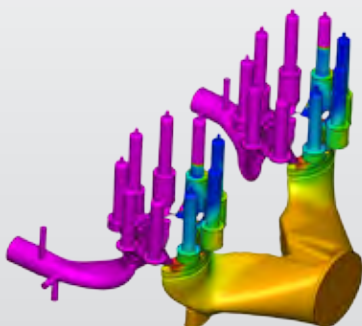
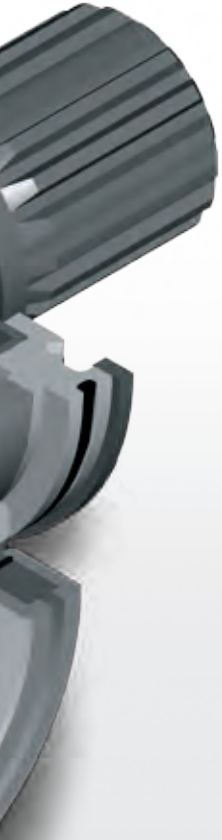
Components in a closed circuit can be regulated in a load-dependent or independent manner. In this way, travel drive can for instance be matched accurately to a vehicle's travel characteristic. Precise regulation of components in an open circuit with low losses is assured by a close tolerance field.

Optimised flow

Modern CFD software is used to minimise pressure losses in the ports. Simulation methods and measurements ensure that pressure pulsations remain low and the timing can be adjusted to suit the optimal operating point.

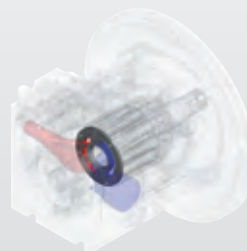
Reduced friction

New materials and construction principles such as the combination of piston and sliding shoe keep friction losses low.



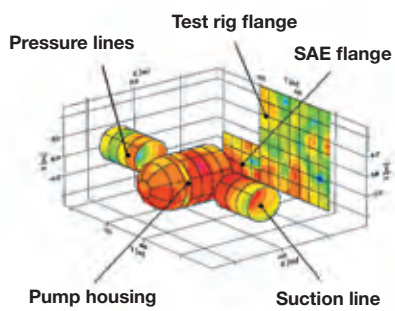
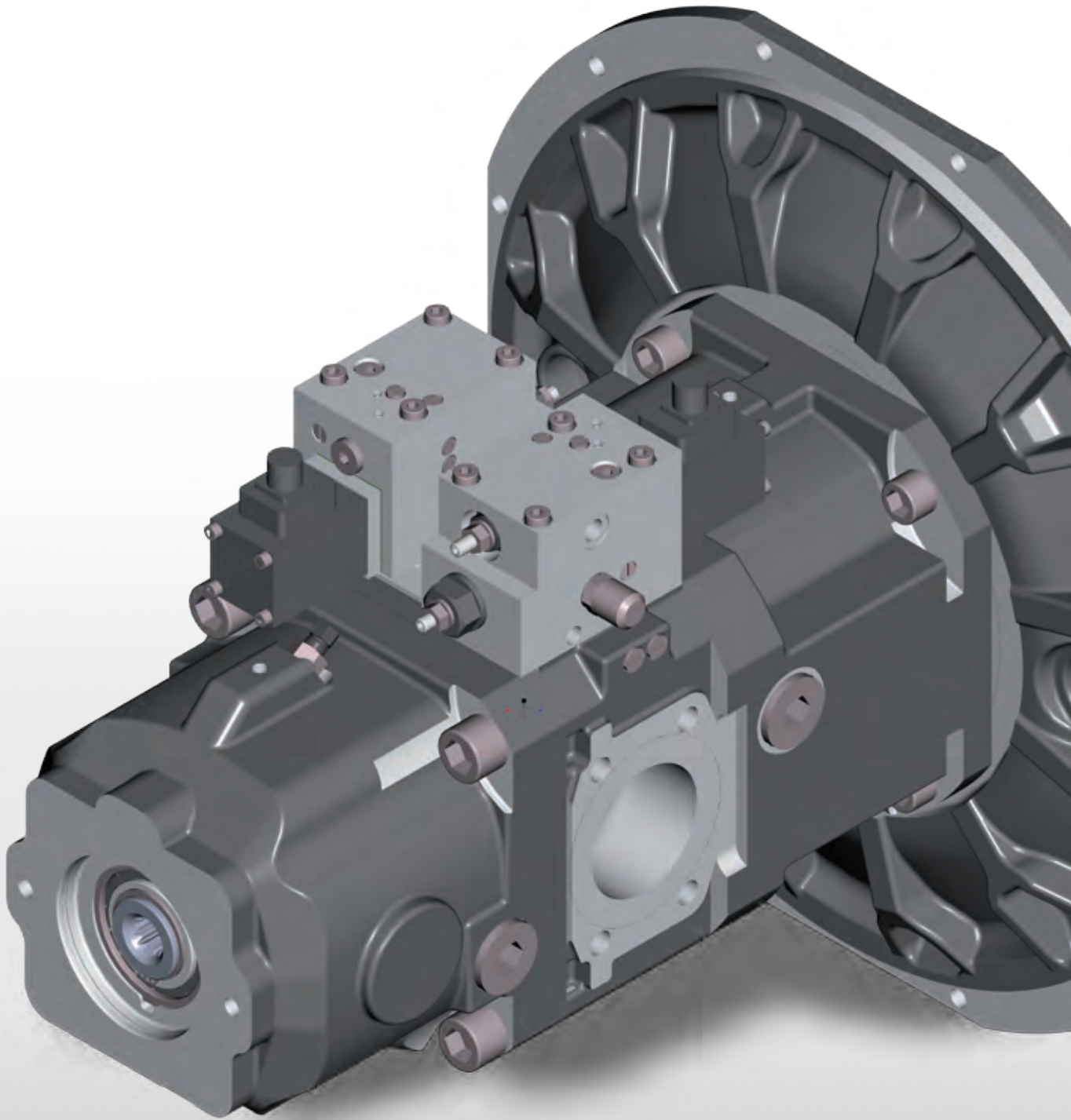
CFD simulation

- Timing simulation
- Determining optimal operating point by adaptation of valve plate geometry
- Improved efficiency and low pulsation



Valve plate

The discharging grooves exert an influence on noise generation and efficiency. They have been optimised by simulation and the results validated by testing.



Distribution of sound intensity.

Low noise

Modern CAE tools are used for the design and development of Liebherr's hydraulic pumps and motors. Measurements are taken on the manufacturer's own acoustic test rig, in order to keep pulsation and noise emission as low as possible.

Optimal construction

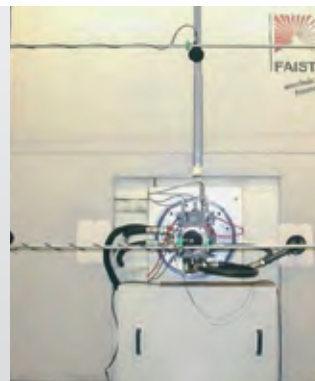
The strong, closed housing with integrated bearings for swivel joke adjustment and reinforced SAE assembling flanges reduce noise emissions considerably.

Vibrational behavior

Using the finite element method (FEM) pump or motor vibration can be calculated and the shape and structure of the housing optimised. Increasing the rigidity of the housing has a positive effect on the acoustic behavior of the machine.



Noise is measured in an acoustic chamber



Noise measurements

Various tests are carried out:

- Long-term tests
- Component tests
- Function tests

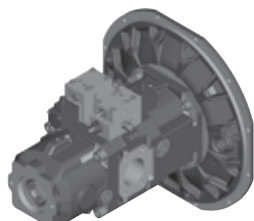
Contents



DPVO

Variable displacement pump, open circuit

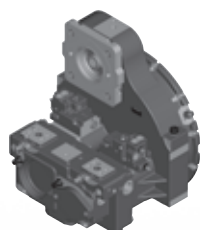
14-15



DPVD

Double variable displacement pump, open circuit

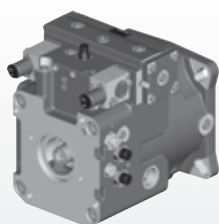
16-17



DPVP

Parallel pump – variable displacement, open circuit

18-19



DPVG

Variable displacement pump, closed circuit

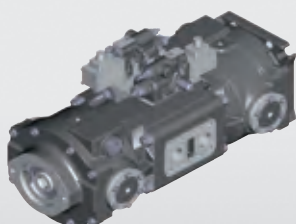
20-21



LPF

Constant displacement pump, open circuit

22-23



LPVD

Double variable displacement pump, open circuit

24-25

Hydraulic pumps

Open circuit

Axial piston pumps are designed for hydrostatic open-circuit drives. The flow volume is proportional to the drive speed and the displacement volume.

The volumetric flow can be varied steplessly by altering the displacement of the swashplate

Operating pressure range, suction side

Absolute pressure at port S

$P_{abs_{min}} = 0,8 \text{ bar}$

$P_{abs_{max}} = 2 \text{ bar}$

Operating pressure range, output side

Pressure at port A

Series A:

Nominal pressure $P_N = 350 \text{ bar}$;

working pressure $P_{max} = 380 \text{ bar}$

Series D:

Nominal pressure $P_N = 380 \text{ bar}$;

working pressure $P_{max} = 400 \text{ bar}$

Closed circuit

DPVG axial piston pumps are designed for closed circuit hydrostatic drives. The flow volume is proportional to the drive speed and displacement volume, and can be adjusted steplessly.

As the swivel angle of the swashplate increases, the volumetric flow rises from 0 toward its maximum value.

Two high pressure limiting and feed valves protect the pump and the motor, and are integrated directly into the DPVG.

The integrated auxiliary boost pump acts as a feed and control-circuit oil pump and is protected by a boost pressure relief valve. Integrated pressure cutoff is available as an option.

Operating pressure range

Pressure at port A or B

Nominal pressure $P_N = 450 \text{ bar}$

Maximum pressure $P_{max} = 500 \text{ bar}$

Boost pressure (at 2000 1/min) $P_{sp} = 20 \text{ to } 35 \text{ bar}$

Auxiliary pump

Suction pressure $P_{s_{min}} = 0.8 \text{ bar absolute}$

During cold start = 0.5 bar absolute

Housing pressure

The maximum housing pressure of 2 bar should not be exceeded.

Direction of rotation

Preferred direction of rotation: clockwise

Counter-clockwise rotation on request

Through drive

Through drive to additional auxiliary pumps is possible on request.

Installed position

Preferred installed position: with suction port at bottom.

Installed position to be avoided: regulating device at bottom.

Zero displacement volume

Only possible for a short time at max. speed (risk of overheating).

For further technical data, see pages 14 to 25.

Temperature range

The pumps are authorised to operate between - 25°C and 115°C.

For operation below - 25°C please consult the manufacturer.

Pressure fluids

See page 27

Fluid leakage pressure

Permissible fluid leakage pressure = 2 bar

Installed position

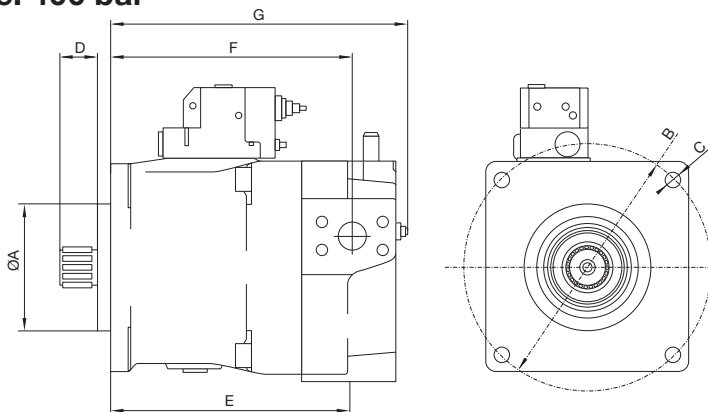
Any position is permitted. The housing must be filled with the pressure fluid and bled.

Direction of rotation

Either direction is permitted

Series D: variable displacement pump DPVO (open circuit)

Nominal pressure: 380 bar / Maximum pressure: 400 bar



Nominal size				108	165	215	215i*
Displacement		$V_{g \max}$	cm ³	107.7	167.8	216.6	216.6
Max. speed	at $V_{g \max}$ **	n_{\max}	min ⁻¹	2400	2100	2000	2500
Volumetric flow	at n_{\max}	$q_{v \max}$	L/min	258	352	433	542
Drive power	$\Delta_p = 380$ bar	P_{\max}	kW	163	223	274	343
Drive torque	$\Delta_p = 380$ bar	T_{\max}	Nm	651	1015	1310	1310

* with impeller.

** These values apply with an absolute pressure of 1 bar at the suction port. Higher suction limit values are possible if the suction pressure P_{abs} is raised at the suction port.

Product dimensions***	(mm)	108	165	215	215i*
Splined shaft profile	DIN 5480 tol. 9g	W40x2x18	W45x2x21	W50x2x24	W50x2x24
Centering diameter	A	361.95	447.7	447.7	165.1
Screw connecting diameter	B	403	466.7	466.7	317.5
Fastening bores	C	11	11	11	21
Splined shaft length	D	46	49	45	49.1
SAE connection length, suction	E	234.5	276.5	326	335
SAE connection length, pressure	F	250.5	260.5	329.5	319
Overall length	G	310.5	347.5	400	398
Pressure port	SAE (6000 psi)	1"	1 1/4"	1 1/2"	1 1/2"
Suction port	SAE (500 psi)	2 1/2"	3"	3 1/2"	3 1/2"
Oil leakage port		M26x1.5	M26x1.5	M33x2	M33x2

*** Dimensions may vary according to configuration and additional equipment (installation drawing on request).

Note

Various mounting flanges are possible (SAE J617a, SAE J744, DIN/ISO 3019)

Integrated gear-type pump for control circuit oil is possible.

Through-drive for pumps up to the same size as the installed pump is possible.

Control / regulation

Electric proportional adjustment (positive or negative characteristic curve)

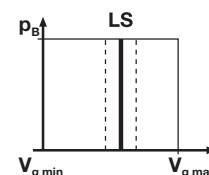
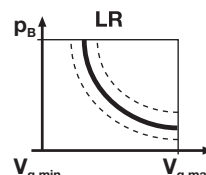
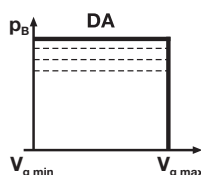
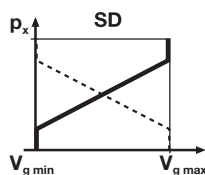
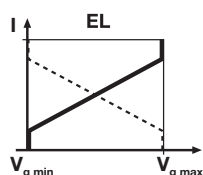
Hydraulic adjustment proportional to control pressure (positive or negative characteristic curve)

Pressure control or pressure cutoff

Other regulator function combinations available on request.

Hyperbolic power regulation

Load Sensing



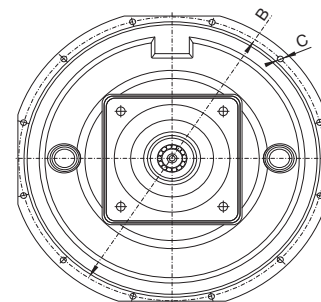
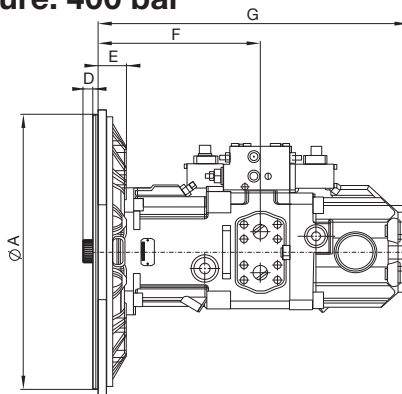
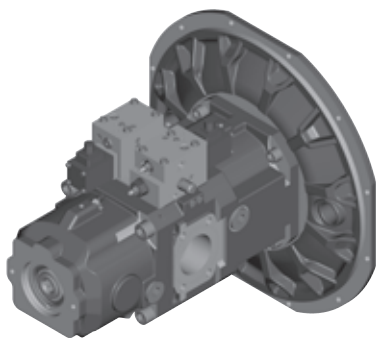
Type key for Series D hydraulic pumps

	DPV	0	/																	
Pump type	I	DPV																		
Variable displacement pump, series D																				
Circuit type		0																		
Open																				
Nominal size		108	165	215																
Minimum displacement*		•	•	•	•	000	-	032.5												
0 - 15 % of $V_{g\ max}$, value in [cm ³]																				
* Other values on request																				
Control / regulation*		•	•	•	•	EL / DA														
Electric proportional adjustment / pressure cutoff		•	•	•	•	LR / LS														
Hyperbolic power control / load sensing		○	○	•	•	LR / SD / DA														
Hyperbolic power control / hydraulic adjustment proportional to control pressure/ pressure cutoff		○	○	•	•	EL / LS														
Electric proportional adjustment / load sensing		•	○	○	○	LU														
Fan drive		○	○	○	○	DA														
Pressure control or pressure cutoff																				
* Other controls on request																				
Version						1														
						2														
Direction of rotation (looking at input shaft)		•	•	•	•	R														
right		○	•	•	•	L														
left																				
Mounting flange*		○	○	○	○	11														
Diesel engine flange SAE 1 (SAE J617a)		•	•	•	•	12														
Diesel engine flange SAE 2 (SAE J617a)		○	○	-	-	13														
Diesel engine flange SAE 3 (SAE J617a)		•	•	-	-	14														
Diesel engine flange SAE 4 (SAE J617a)		○	○	-	-	24														
SAE D (SAE J744)		-	-	-	-	25														
SAE E (SAE J744)		•	•	•	•	31 ...														
DIN / ISO 3019		○	○	○	○	51 ...														
Non-standard flange																				
* Other mounting flanges on request																				
Shaft end		•	•	•	•	1														
Splined shaft DIN 5480		○	○	○	○	2														
Splined shaft SAE J744																				
Connections		•	•	•	•	A														
High-pressure ports: SAE (6000 PSI)		•	•	•	•	B														
Suction ports: SAE (500 PSI)		○	○	○	○															
Oil leakage and control pressure ports: metric (DIN 3852)																				
All ports: metric thread																				
Charge pump / impeller		•	•	-	-	O														
Without impeller		-	-	•	•	I														
With impeller																				
Gear-type pump for control circuit oil		•	•	•	•	00														
Without gear-type pump		•	•	○	○	24														
With gear-type pump $V_g = 24$ [cm ³]																				
Through-drive		•	•	•	•	0														
Without through-drive		○	○	○	○	A														
SAE A		•	•	•	•	B														
SAE B		○	○	○	○	C														
SAE C		○	•	○	○	D														
SAE D		○	○	•	•	E														
SAE E		•	•	○	○	K														
Non-standard flange with through-drive																				

- available
- on request
- not available

Series D: double variable displacement pump DPVD (open circuit)

Nominal pressure: 380 bar / Maximum pressure: 400 bar



Nominal size		All data for each drive		108
Displacement		$V_{g \max}$	cm ³	107.7
Max. speed	at $V_{g \max}^*$	n_{\max}	min ⁻¹	2200
Volumetric flow	at n_{\max}	$q_{v \max}$	L/min	237
Drive power	$\Delta_p = 380$ bar	P_{\max}	kW	150
Drive torque	$\Delta_p = 380$ bar	T_{\max}	Nm	651

* These values apply with an absolute pressure of 1 bar at the suction port. Higher suction limit values are possible if the suction pressure P_{abs} is raised at the suction port. .

Product dimensions**	(mm)	108
Splined shaft profile	DIN 5480 tol. 9g	W40x2x18
Centering diameter	A	511.18
Screw connecting diameter	B	530.2
Fastening bores	C	11
Splined shaft length	D	45
Shaft collar / mounting flange	E	48
Connection length, SAE flanges (suction and pressure)	F	277.9
Overall length	G	531.9
Pressure ports	SAE (6000 psi)	1"
Suction port	SAE (500 psi)	3"
Oil leakage port		M33x2

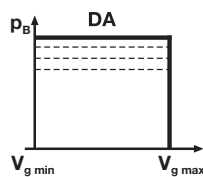
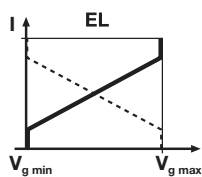
** Dimensions may vary according to configuration and additional equipment (installation drawing on request).

Control / regulation

Other regulator function combinations available on request.

Electric proportional adjustment

Pressure control or pressure cutoff



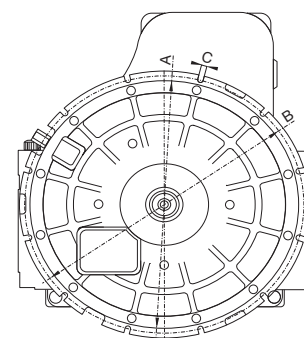
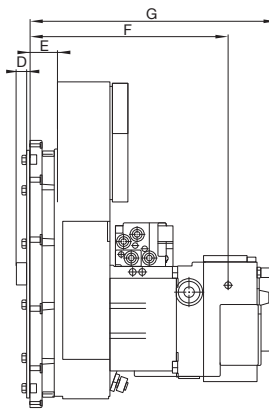
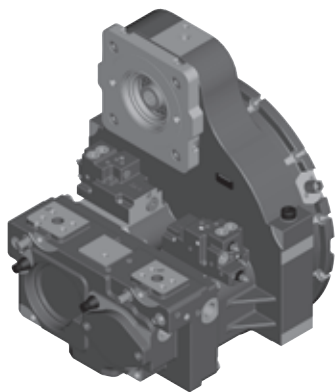
Type key for Series D hydraulic pumps

	DPVD	0	/																	
Pump type																				
Double variable displacement pump, Series D	DPVD																			
Circuit type																				
Open		0																		
Nominal size (per drive)																				
		108																		
Minimum displacement (per drive)*																				
0 - 15 % of $V_{g,max}$, value in [cm ³]		•																		
* Other values on request																				
Control / regulation**																				
Electric proportional adjustment / pressure cutoff		•																		
** Other controls on request																				
Version																				
Direction of rotation (looking at input shaft)																				
right		•																		
left		○																		
Mounting flange***																				
Diesel engine flange SAE 1 (SAE J617a)		•																		
Diesel engine flange SAE 2 (SAE J617a)		○																		
Diesel engine flange SAE 3 (SAE J617a)		○																		
Diesel engine flange SAE 4 (SAE J617a)		○																		
SAE D (SAE J744)		○																		
DIN / ISO 3019		○																		
Non-standard flange		○																		
*** Other mounting flanges on request																				
Shaft end																				
Splined shaft DIN 5480		•																		
Splined shaft SAE J744		○																		
Connections																				
High-pressure ports: SAE (6000 PSI)		•																		
Suction ports: SAE (500 PSI)		•																		
Oil leakage and control pressure ports: metric (DIN 3852)		•																		
All ports: metric thread		○																		
Charge pump / impeller																				
Without impeller		•																		
With impeller		-																		
Gear-type pump for control circuit oil																				
Without gear-type pump		•																		
With gear-type pump $V_g = 24$ [cm ³]		○																		
Through-drive																				
Without through-drive		○																		
SAE A		○																		
SAE B		•																		
Non-standard flange with through-drive		○																		

- available
- on request
- not available

Series D: parallel variable displacement pump DPVP (open circuit)

Nominal pressure: 380 bar / Maximum pressure: 400 bar



Nominal size	All data for each power unit		108	165	165i*	
Displacement		$V_{g\ max}$	cm ³	107.7	167.8	167.8
Max. drive speed	at $V_{g\ max}$ **	n_{max}	min ⁻¹	2300	2100	2600
Volumetric flow	at n_{max}	$q_{v\ max}$	L/min	248	352	436
Drive power	$\Delta_p = 380\ bar$	P_{max}	kW	163	223	276
Drive torque	$\Delta_p = 380\ bar$	T_{max}	Nm	651	1015	1015

* with impeller.

** These values apply with an absolute pressure of 1 bar at the suction port. Higher suction limit values are possible if the suction pressure P_{abs} is raised at the suction port.

Product dimensions***	(mm)	108	165	165i*
Splined shaft profile	DIN 5480 tol. 9g	W50x2x24	W70x3x22	W70x3x22
Centering diameter	A	511.18****	511.18	511.18
Screw connecting diameter	B	530.2	530.2	530.2
Fastening bores	C	11	11	11
Splined shaft length	D	45	67	67
Shaft collar / mounting flange	E	46	26,5	26,5
SAE connection length pressure	F	369.4	423	423
Overall length	G	462	517.9	605.9
Pressure ports	SAE (6000 psi)	1"	1 1/4"	1 1/4"
Suction port	SAE (500 psi)	3"	4"	3"
Oil leakage port		M33x2	M33x2	M33x2

*** Dimensions may vary according to configuration and additional equipment (installation drawing on request).

****DPVP 108 also available with SAE-2 mounting flange.

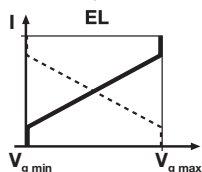
Note

DPVP pumps can be used in single or twin circuit systems.
 Integrated pumps gear-type pump for control circuit oil (24 cc) standard on output II, other versions on request.
 Pump transmission housing with and without 3rd output (direction of rotation left or right possible at output III).
 Through-drives to output I and/or output II are possible.
 Different pump transmission ratios are possible (precise data available on request)

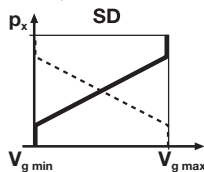
Control / regulation

Other regulator function combinations available on request.

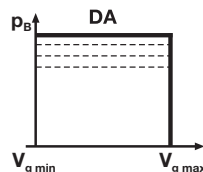
Electric proportional adjustment (positive or negative characteristic curve)



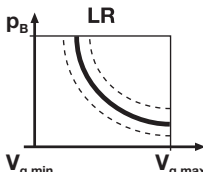
Hydraulic adjustment proportional to control pressure (positive or negative characteristic curve)



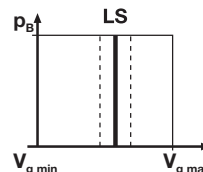
Pressure control or pressure cutoff



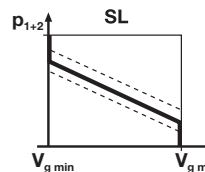
Hyperbolic power regulation



Load Sensing



Cumulative power regulation



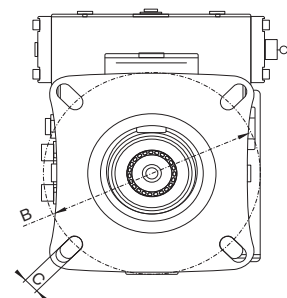
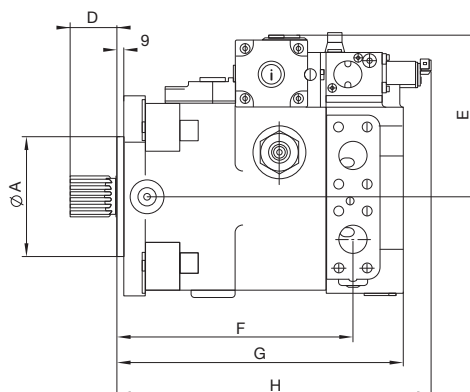
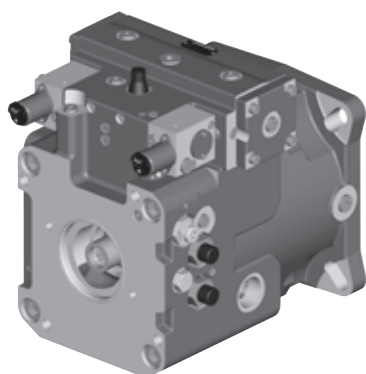
Type key for Series D hydraulic pumps

	DPVP	0	/																	
Pump type																				
Parallel variable displacement pump, Series D	DPVP	I																		
Circuit type																				
Open		0																		
Nominal size (per drive)																				
		108	165																	
Minimum displacement (per drive)*																				
0 - 15 % of $V_{g \max}$, value in [cm ³]		•	•																	
* Other values on request																				
Control / regulation**																				
Electric proportional adjustment / pressure cutoff	○	○																		
Hyperbolic power control / load sensing	•	○																		
Cumulative power control / Adjustment proportional to control pressure	•	•																		
Hyperbolic power control / Adjustment proportional to control pressure / pressure cutoff	•	•																		
Electric proportional adjustment / Load sensing	•	•																		
** Other controls on request																				
Version																				
Direction of rotation (looking at input shaft)																				
right	•	•																		
left	-	-																		
Mounting flange																				
Diesel engine flange SAE 1 (SAE J617a)	•	•																		
Diesel engine flange SAE 2 (SAE J617a)	•	-																		
Shaft end																				
Splined shaft DIN 5480	•	•																		
Splined shaft SAE J744	○	○																		
Connections																				
High-pressure ports: SAE (6000 PSI)	•	•																		
Suction ports: SAE (500 PSI)	•	•																		
Oil leakage and control pressure ports: metric (DIN 3852)	•	•																		
All ports: metric thread	○	○																		
Charge pump / impeller																				
Without impeller	•	•																		
With impeller	-	•																		
Gear-type pump																				
Without gear-type pump	○	○																		
With gear-type pump $V_g = 24$ [cm ³]	•	•																		
Through-drive (side P1 and / or P2)																				
Without through-drive	•	•																		
SAE A	○	○																		
SAE B	•	•																		
SAE C	○	○																		
SAE D	○	○																		

- available
- on request
- not available

Series D: variable displacement pump DPVG (closed circuit)

Nominal pressure: 450 bar / Maximum pressure: 500 bar



Nominal size			108	165	250
Displacement		$V_{g \max}$ cm ³	107.7	167.8	250.5
Max. speed	at $V_{g \max}$	n_{\max} min ⁻¹	3000	2700	2400
Volumetric flow	at n_{\max}	$q_{v \max}$ L/min	323	453	601
Drive power	$\Delta_p = 430$ bar	P_{\max} kW	232	325	431
Drive torque	$\Delta_p = 430$ bar	T_{\max} Nm	737	1149	1715

Product dimensions*	(mm)	108	165	250
Splined shaft profile	DIN 5480 tol. 9g	W40x2x18	W45x2x21	W55x2x26
Centering diameter	A	180	200	224
Screw connecting diameter	B	224	250	280
Fastening bores	C	17	21	22
Splined shaft length	D	45	51	56
Height adjustment	E	190	206	225.5
SAE connection length, pressure	F	223	270	293
Length without/with integrated feed pump	G	268 / 315.5	- / 323	366.5 / -
Overall length	H	330.5	358.5	392.5
Pressure ports	SAE (6000 psi)	1"	1 1/4"	1 1/2"
Oil leakage port		M33x2	M42x2	M42x2

* Dimensions may vary according to configuration and additional equipment (installation drawing on request).

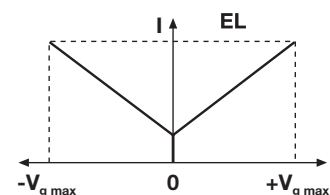
Note

Different mounting flanges are possible (SAE J617a, SAE J744, DIN/ISO 3019).
 With/without integrated boost pump; integrated boost pressure relief valve is possible.
 Through drive for pumps up to same size is possible.
 HD port are possible at the side or underneath.

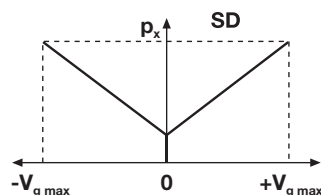
Control / regulation

Other regulator function combinations available on request.

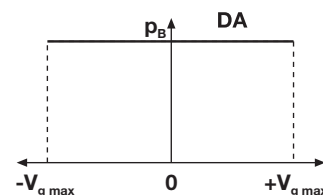
Electric proportional adjustment



Hydraulic proportional adjustment depending on control pressure



Pressure cutoff



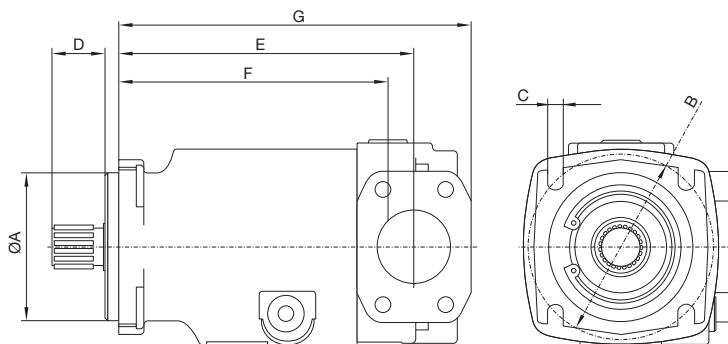
Type key for Series D hydraulic pumps

	DPVG	G	/															
Pump type	I																	
Variable displacement pump, series D	DPVG																	
Circuit type		G																
closed		G																
Nominal size																		
					108	165	250											
Minimum displacement																		
$V_{g \min} = 0$ (cm ³)	•	•	•					000										
Control / regulation																		
Electric proportional adjustment / pressure cutoff	•	•	•					EL / DA										
Electric proportional adjustment	•	•	•					EL										
Hydraulic proportional adjustment depending on control pressure	•	•	•					SD										
Torque control, hydraulic	•	•	•					TCH										
Torque control, electric	•	•	•					TCE										
Speed control, hydraulic	•	•	•					DZH										
Speed control, electric	•	•	•					DZE										
Version																		
								1										
Direction of rotation (looking at input shaft)																		
right	•	•	•					R										
left	•	•	•					L										
Mounting flange*																		
Diesel engine flange SAE 1 (SAE J617a)	•	•	•					11										
Diesel engine flange SAE 2 (SAE J617a)	•	•	•					12										
Diesel engine flange SAE 3 (SAE J617a)	•	•	•					13										
Diesel engine flange SAE 4 (SAE J617a)	•	•	•					14										
SAE D (SAE J744)	•	•	•					24										
SAE E (SAE J744)	•	•	•					25										
DIN / ISO 3019	•	•	•					31 ...										
Transmission flange	•	•	•					41 ...										
Non-standard flange	•	•	•					51 ...										
* Other mounting flanges on request																		
Shaft end																		
Splined shaft DIN 5480	•	•	•					1										
Splined shaft SAE J744	•	•	•					2										
Connections																		
High pressure ports: SAE (6000 PSI)	•	•	•					A										
Suction ports: SAE (500 PSI)	•	•	•					A										
Oil leakage and control pressure ports: metric (DIN 3852)	•	•	•					A										
All ports: metric thread	•	•	•					B										
Attachments																		
No attachment	•	•	•					O										
Integrated boost pump**																		
Without boost pump	•	•	•					00										
With boost pump, $V_g = 30$ [cm ³]	•	•	•					30										
With boost pump, $V_g = 40$ [cm ³]	•	•	•					40										
With boost pump, $V_g = 50$ [cm ³]	•	•	•					50										
** Other nominal sizes on request																		
Through-drive																		
Without through-drive	•	•	•					0										
SAE A	•	•	•					A										
SAE B	•	•	•					B										
SAE C	•	•	•					C										
SAE D	•	•	•					D										
SAE E	•	•	•					E										
Non-standard flange with through-drive	•	•	•					K										
Valve																		
Feed valve	•	•	•					NS										
High pressure relief valve	•	•	•					DB										

- available
- on request
- not available

Series A: constant displacement pump LPF (open circuit)

Nominal pressure: 350 bar / Maximum pressure: 380 bar



Nominal size				45	75
Displacement		$V_{g\ max}$	cm ³	45.6	75
Max. speed	at $V_{g\ max}$	n_{max}	min ⁻¹	2700	2540
Volumetric flow	at n_{max}	$q_{v\ max}$	L/min	123	191
Drive power	$\Delta_p = 350\ bar$	P_{max}	kW	82	127
Drive torque	$\Delta_p = 350\ bar$	T_{max}	Nm	290	478

Product dimensions*	(mm)	45	75
Splined shaft profile	DIN 5480 tol. 9g	W30x2x14	W35x2x16
Centering diameter	A	100	125
Screw connecting diameter	B	125	160
Fastening bores	C	11.5	14
Splined shaft length	D	35	41.5
SAE connection length, suction	E	199.5	221.5
SAE connection length, pressure	F	186	205
Overall length	G	238	266
Pressure port	SAE (6000 psi)	3/4"	1"
Suction port	SAE (500 psi)	2"	2"
Oil leakage port		M18x1.5	M18x1.5

* Dimensions may vary according to configuration and additional equipment (installation drawing on request).

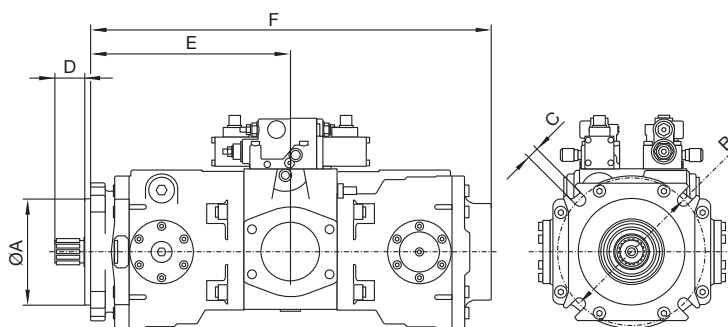
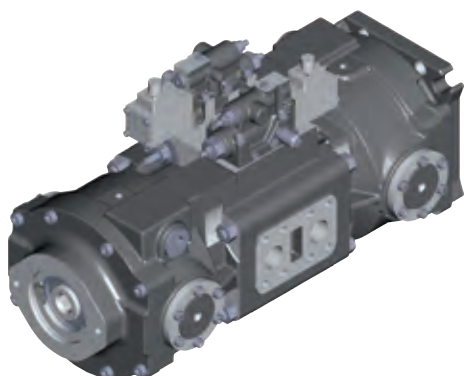
Type key for Series A hydraulic pumps

		LPF		/				
Pump type	Constant displacement pump, Series A	LPF						
Nominal size		45	75					
Version		•	•				1	
Circuit type	Open						O	
Control / regulation	No regulator	•	•				00	
Direction of rotation (looking at input shaft)	right	•	○				R	
	left	•	•				L	
Drive speed	Applied speed value [1/min]						XXXX	
Mounting flange	Non-standard flange	○	○				5	
	ISO 4-hole	•	•				6	
	ISO 2-hole	○	○				7	
Gear-type pump / Through-drive	Without through drive and gear-type pump	•	•				000	

- available
- on request
- not available

Series A: Double variable displacement pump LPVD (open circuit)

Nominal pressure: 350 bar / Maximum pressure: 380 bar



Nominal size				45	64	75	90	100	107	125	140	150
All data for each power unit												
Displacement		$V_{g \max}$	cm ³	45.6	64.3	75	90.7	103.1	107.6	125.6	141.2	151.4
Max. speed	at $V_{g \max}$ *	n_{\max}	min ⁻¹	3000	2760	2540	2430	2320	2290	2180	2150	2100
Volumetric flow	at n_{\max}	$q_{V \max}$	L/min	137	177	191	220	239	246	274	304	318
Drive power	$\Delta_p = 350$ bar	P_{\max}	kW	91	118	127	147	159	164	183	203	212
Drive torque	$\Delta_p = 350$ bar	T_{\max}	Nm	290	408	477	578	654	684	802	902	964

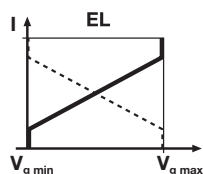
* These values apply with an absolute pressure of 1 bar at the suction port. Higher suction limit values are possible if the suction pressure P_{abs} is raised at the suction port.

Product dimensions**	(mm)	45	64	75	90	100	107	125	140	150
Splined shaft profile	DIN 5480 Tol. 9g	W30x2x14	W35x2x16	W35x2x16	W35x2x16	W40x2x18	W40x2x18	W40x2x18	W40x2x18	W40x2x18
Centering diameter	A	127	361.95	447.7	447.7	447.7	447.7	511.18	160	160
Screw connecting diameter	B	246.4	381	466.7	466.7	466.7	466.7	530.2	310	310
Fastening bores	C	17	11	11	11	17	11	11	18	18
Splined shaft length	D	35	41	41.5	41	47.25	47.25	47	46	46
Connection length. SAE flanges (suction and pressure)	E	219	249	259	283.5	258	258	310	310	310
Overall length	F	449	517	561	563.5	583	583	624	624	624
Pressure ports	SAE (6000 psi)	3/4"	1"	1"	1"	1"	1"	1 1/4"	1 1/4"	1 1/4"
Suction port	SAE (500 psi)	2 1/2"	3"	3"	3"	3"	3"	3 1/2"	3 1/2"	3 1/2"
Oil leakage port		M33x2	M26x1.5	M33x2	M26x1.5	M33x2	M33x2	M33x2	M33x2	M32x2

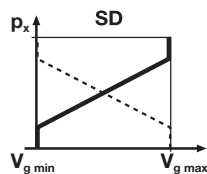
** Dimensions may vary according to configuration and additional equipment (installation drawing on request).

Control / regulation

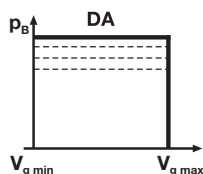
Electric proportional adjustment (positive or negative characteristic curve)



Hydraulic adjustment proportional to control pressure (positive or negative characteristic curve)

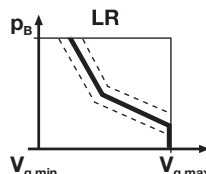


Pressure control or pressure cutoff

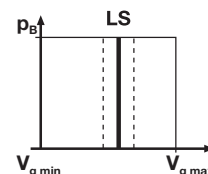


Other regulator function combinations available on request.

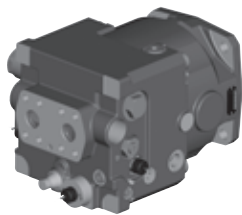
Power regulation



Load Sensing



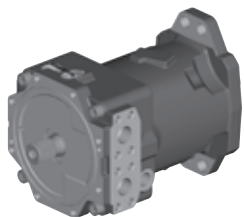
Contents



DMVA

Variable displacement motor

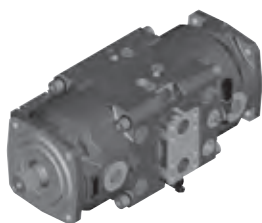
28-29



DMFA

Fixed displacement motor

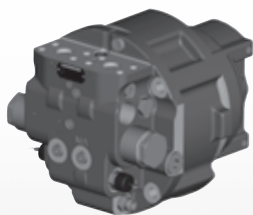
30-31



DMVD

Variable displacement double motor

32-33



CMVE

Variable displacement plug-in motor, open circuit

34-35



LMF

Fixed displacement motor

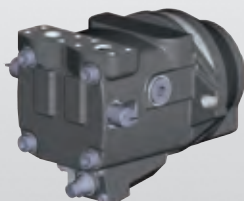
36-37



FMF

Fixed displacement plug-in motor

38-39



FMV

Variable displacement plug-in motor, open circuit

40-41

Hydraulic motors

Liebherr axial piston motors (DMVA, DMFA, DMVD, CMVE, LMF, FMF, FMV) are of the swashplate type and designed for open and closed circuit hydrostatic drives. The motors are suitable for mobile applications. The output speed is proportional to the displacement flow and inversely proportional to the displacement. Through-drives and attached holding brakes are available on request.

Operating pressure range

Pressure at port A and B

Working pressure (see technical data)

Maximum housing pressure = 2 bar

Direction of rotation

Clockwise and counter-clockwise

Installed position

Any suitable position

An oil leakage port at the top should be arranged to drain into the tank.

Through-drive

on request.

Fill housing with oil before start-up.

If special pressure fluids are to be used, please discuss this with the manufacturer.

For further technical data, see pages 28 to 41.

Pressure fluids

When choosing pressure fluids and operating conditions, please comply with the Liebherr "Lubricants and operating fluids" data sheets.

If operating with HF or environment-friendly pressure fluids, note that restrictions may be stated in the technical sheets; please consult the manufacturer if necessary (when ordering, please state which pressure fluid is to be used). Operation with HFA, HFB and HFC pressure fluids calls for special additional measures.

Operating viscosity range

We recommend selecting an operating viscosity (at regular operating temperature) in the range that is optimal with regard to efficiency and operating time, namely V_{opt} = optimal operating viscosity 16 ... 36 mm²/s, referred to the circuit temperature.

Viscosity limits

The following values apply in extreme conditions:

$$V_{min} = 10 \text{ mm}^2/\text{s}$$

For a short period, max. permitted temperature of

$$t_{max} = 115^\circ\text{C}$$

Make sure that the maximum pressure fluid temperature of 115° C is not exceeded even locally (for instance in the vicinity of bearings).

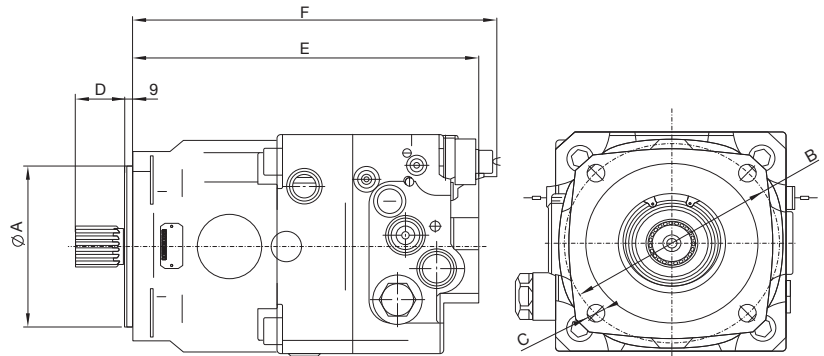
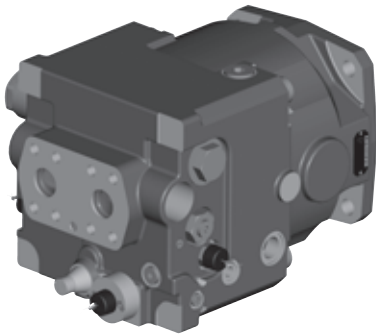
$$V_{max} = 1600 \text{ mm}^2/\text{s}$$

For a short period during a cold start ($t_{min} = -25^\circ\text{C}$).

At temperatures between -25° C and -40° C special measures are needed; please consult the manufacturer.

Series D: DMVA motor (variable displacement)

NG108 & NG165: Closed circuit - nominal pressure: 450 bar / maximum pressure: 500 bar
 NG355: Closed circuit - nominal pressure: 380 bar / maximum pressure: 400 bar
 Open circuit - nominal pressure: 380 bar / maximum pressure: 400 bar



Nominal size			108	165	355
Displacement		$V_{g \max}$ cm ³	107.7	167.8	355.6
Max. speed	at $V_{g \max}$ and Δp_{\max}	n_{\max} min ⁻¹	3350	3000	2400
Max. speed	at $V_g / V_{g \max} = 0,65$ and $\Delta p = 200$ bar	n_{\max} min ⁻¹	5125	4590	3670
Flow	at n_{\max}	$q_{v \max}$ L/min	361	503	853
Output power	$\Delta p = 430$ bar, NG355 with $\Delta p = 360$ bar	P_{\max} kW	259	361	512
Output torque	$\Delta p = 430$ bar, NG355 with $\Delta p = 360$ bar	T_{\max} Nm	737	1149	2038

Product dimensions*	(mm)	108	165	355
Splined shaft profile	DIN 5480 tol. 9g	W40x2x18	W45x2x21	W60x2x28
Centering diameter	A tol. h8	160	180	250
Screw connecting diameter	B	200	224	-
Fastening bores	C	17	18	26
Splined shaft length	D	45	51	69
SAE connection length	E	309	357	433.5
Overall length	F	199	226	496
Pressure ports	SAE (6000 psi)	1"	1 1/4"	1 1/2"
Oil leakage port		M26x1.5	M26x1.5	M33x2

* Dimensions may vary according to configuration and additional equipment (installation drawing on request).

Note

A brake valve can be attached.
 The pressure port can be at the rear or side on the connecting plate.

Control / regulation

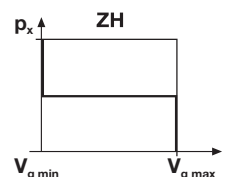
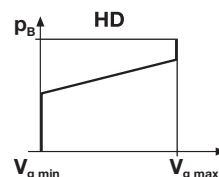
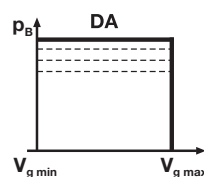
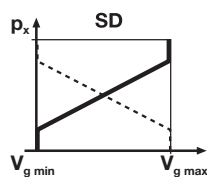
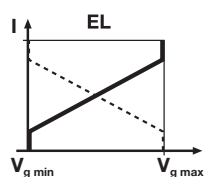
Electrical adjustment with proportional magnet (positive or negative characteristic curve)

Hydraulic adjustment, depending on control pressure (positive or negative characteristic curve)

Pressure cutoff

Hydraulic adjustment, high-pressure related

Hydraulic two-point control



Other regulator function combinations available on request.

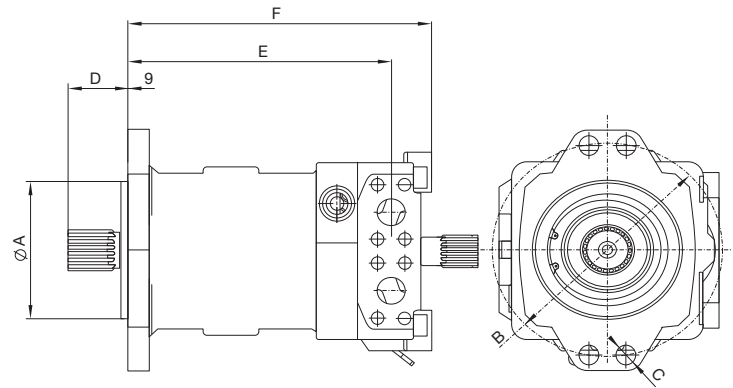
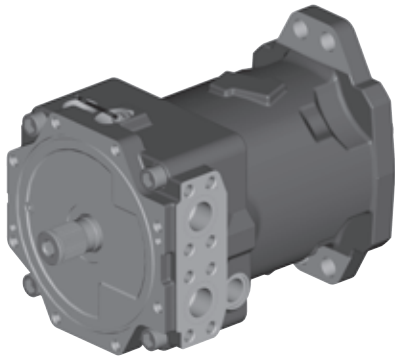
Type key for Series D hydraulic motors

	DMVA		/																	
Motor type	DMVA																			
Circuit type																				
open	O																			
closed	G																			
Nominal size																				
	108 165 355																			
Minimum displacement*																				
0 - 66 [cm ³]	• - -																			0 - 66
41,2 - 151,9 [cm ³]	- • -																			41.2 - 151.9
270 [cm ³] (non-adjustable)	- - •																			270
100 [cm ³] (adjustable)	- - •																			0 - 100
* Other values on request																				
Control / regulation																				
Hydraulic adjustment high pressure related	• • •	o																		HD
Hydraulic adjustment depending on control pressure / pressure cutoff	• • •	o																		SD / DA
Electrical adjustment with proportional magnet	• • •	o																		EL
Hydraulic two point control	o • o	o																		ZH
Electrical adjustment with proportional magnet/ pressure cutoff	• • •	o																		EL / DA
Version																				
																				1
Direction of rotation (looking at input shaft)																				
right	- - -																			R
left	- - -																			L
alternating	• • •																			W
Mounting flange**																				
DIN / ISO 3019	• • •	o																		31...
Non-standard flange	o • o	o																		51...
** Other attachment flanges on request																				
Shaft end																				
Splined shaft DIN 5480	• • •	o																		1
Splined shaft SAE J744	o • o	o																		2
Connections																				
High pressure ports: SAE (6000 PSI)	• • •	o																		A
Oil leakage and control pressure ports: metric (DIN 3852)	• • •	o																		B
All ports: metric thread	o • o	o																		B
Additional equipment																				
No add-on equipment	• • •	o																		0
Through-drive																				
Without through-drive	• • •	o																		0
Non-standard flange with through-drive	o • o	o																		K
Valve / sensor																				
none	• • •	o																		00
Flushing for closed circuit	o • •	o																		SO
Flushing for closed circuit with high pressure relief valve	o • o	o																		SH
Flushing for closed circuit	o • •	o																		MO
Flushing for open circuit with high pressure relief valve	o • o	o																		MH
Resuction valve with high pressure relief valve	o • o	o																		NH
Resuction valve with hydraulically adjustable high pressure relief valve	o • o	o																		NX
Hydraulically adjustable high pressure relief valve	o • o	o																		OX
Brake valve + DEV	• • •	o																		BH
High pressure relief valve	o • •	o																		DB
Feed valve	o • o	o																		NS
Speed sensor	o • •	o																		D

- available
- o on request
- not available

Series D: DMFA motor (fixed displacement)

Open and closed circuit - Nominal pressure: 380 bar / Maximum pressure: 400 bar



Nominal size				355
Displacement		$V_{g \max}$	cm ³	355.6
Max. speed	at $V_{g \max}$ and $\Delta_p = 360$ bar	n_{\max}	min ⁻¹	2400
Flow	at n_{\max}	$q_{v \max}$	L/min	853
Output power	$\Delta_p = 360$ bar	P_{\max}	kW	512
Output torque	$\Delta_p = 360$ bar	T_{\max}	Nm	2034

Product dimensions*	(mm)	355
Splined shaft profile	DIN 5480 tol. 9g	W60x2x28
Centering diameter	A tol. h8	200
Screw connecting diameter	B	**
Fastening bores	C	26
Splined shaft length	D	71
SAE connection length	E	351.5
Overall length	F	467.5
Pressure ports	SAE (6000 psi)	1 1/2"
Oil leakage port		M33x2

* Dimensions may vary according to configuration and additional equipment (installation drawing on request).

** 4-hole non-standard flange.

Note

Flushing valve integrated into connection plate.

External brake valve can be attached to SAE port.

An external Liebherr multi-disc brake can be attached (non-standard flange with through drive shaft).

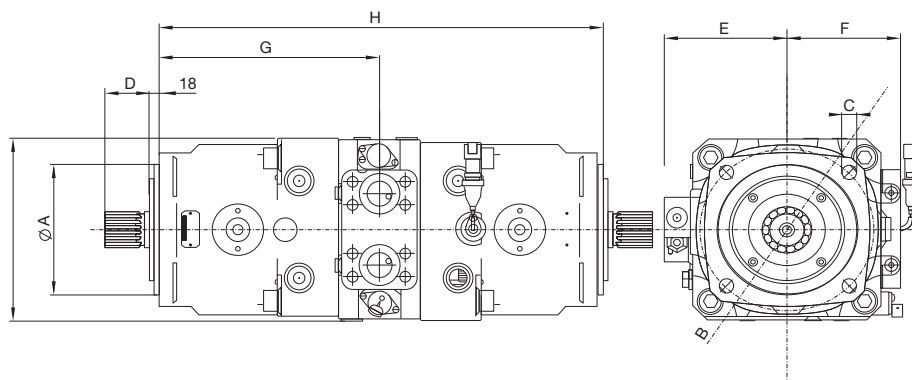
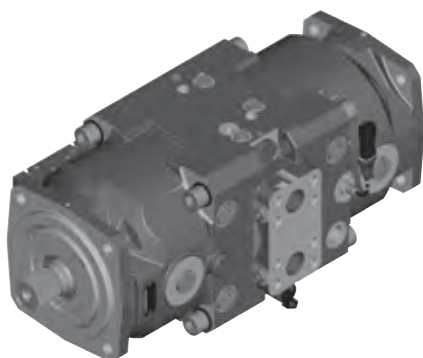
Type key for Series D hydraulic motors

	DMFA	/																		
Motor type	Fixed displacement motor, series D																			
Circuit type	open																			
	closed																			
Nominal size																				
Control / regulation	No regulation																			
Version																				
Direction of rotation (looking at input shaft)	right																			
	left																			
	alternating																			
Mounting flange *	DIN / ISO 3019																			
	Non-standard flange																			
	* Other mounting flanges on request																			
Shaft end	Splined shaft DIN 5480																			
	Splined shaft SAE J744																			
Connections	High pressure ports: SAE (6000 PSI)																			
	Oil leakage and control pressure ports: metric (DIN 3852)																			
	All ports: metric thread																			
Additional equipment	No add-on equipment																			
	Multi-disc brakes																			
Through-drive	Without through-drive																			
	Non-standard flange with through-drive																			
Valve / sensor	none																			
	Flushing valve, closed circuit																			
	Flushing valve, closed circuit with high pressure relief valve																			
	Flushing valve, open circuit																			
	Flushing valve, open circuit with high pressure relief valve																			
	Resuction valve with high pressure relief valve																			
	Resuction valve with hydraulically adjustable high pressure relief valve																			
	Hydraulically adjustable high pressure relief valve																			
	Brake valve + DBV																			
	High pressure relief valve																			
	Feed valve																			
	Speed sensor																			

- available
- on request
- not available

Series D: DMVD double motor (variable displacement)

Closed circuit - Nominal pressure: 450 bar / Maximum pressure: 500 bar



Nominal size				165/108	165/165
Displacement		$V_{g \max}$	cm ³	275	335
Max. speed	at $V_{g \max}$ and $\Delta_p = 430$ bar	n_{\max}	min ⁻¹	3000	3000
Max. speed	at $V_g / V_{g \max} = 0,65$ and $\Delta_p = 200$ bar	n_{\max}	min ⁻¹	4590	4590
Flow	at n_{\max}	$q_{v \max}$	L/min	825	1005
Output power	$\Delta_p = 430$ bar	P_{\max}	kW	591	720
Output torque	$\Delta_p = 430$ bar	T_{\max}	Nm	1883	2294

Product dimensions*	(mm)	165/108	165/165
Splined shaft profile	DIN 5480 tol. 9g	W45x2x21	W45x2x21
Centering diameter	A tol. h8	180	180
Screw connecting diameter	B	224	224
Fastening bores	C	18	18
Splined shaft length	D	55	55
Regulator width dimension	E	157	157
SAE flange width dimension	F	145	148
SAE flange connection length	G	277	277
Overall length	H	539	567
Overall width	I	240	250
Pressure ports	SAE (6000 psi)	1 1/4"	1 1/4"
Oil leakage port		M26x1.5	M26x1.5

* Dimensions may vary according to configuration and additional equipment (installation drawing on request).

Note

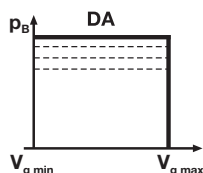
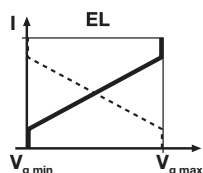
Through-drive possible.

Control / regulation

Electrical adjustment with proportional magnet (positive or negative characteristic curve)

Pressure cutoff

Other regulator function combinations available on request.



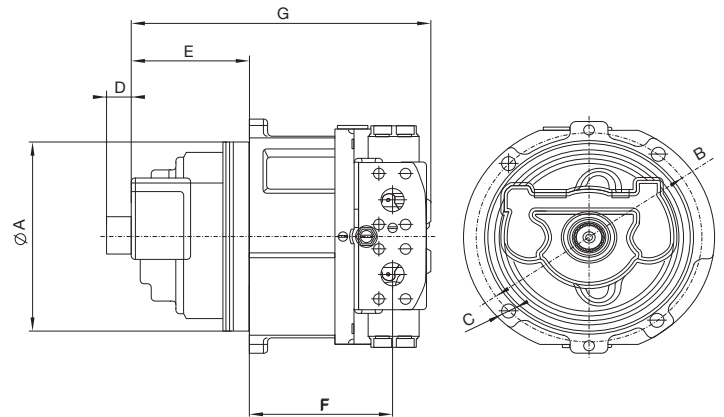
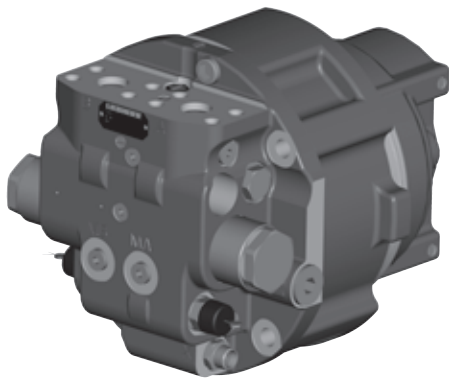
Type key for Series D hydraulic motors

	DMVD	G	/																	
Motor type	Variable displacement motor, Series D																			
Circuit type	closed																			
Nominal size	165/108 165/165																			
Minimum displacement*	0 - 100 [cm ³]																			
* Other values on request																				
Control / regulation	Electric proportional adjustment																			
Electric proportional adjustment / pressure cutoff																				
Version	1																			
Direction of rotation (looking at input shaft)	right																			
left																				
alternating																				
Mounting flange**	DIN / ISO 3019																			
Non-standard flange																				
** Other mounting flanges on request																				
Shaft end	Splined shaft DIN 5480																			
Splined shaft SAE J744																				
Connections	High pressure ports: SAE (6000 PSI)																			
Oil leakage and control pressure ports: metric (DIN 3852)																				
All ports: metric thread																				
Additional equipment	No add-on equipment																			
Through-drive	Without through-drive																			
Non-standard flange with through-drive																				
Valve / sensor	none																			
Flushing valve, closed circuit																				
Flushing valve, closed circuit with high pressure relief valve																				
Flushing valve, open circuit																				
Flushing valve, open circuit with high pressure relief valve																				
Resuction valve with high pressure relief valve																				
Resuction valve with hydraulically adjustable high pressure relief valve																				
Hydraulically adjustable high pressure relief valve																				
Brake valve + DBV																				
High pressure relief valve																				
Feed valve																				
Crawling speed																				
Speed sensor																				

- available
- on request
- not available

Series C: CMVE variable displacement plug-in motor (open circuit)

Nominal pressure: 380 bar / Maximum pressure: 400 bar



Nominal size				108	165
Displacement		V_g	cm ³	108	165.9
Max. speed	at $V_{g\ max}$ and $\Delta_p = 360$ bar	n_{max}	min ⁻¹	3470	3000
Max. speed	at $V_g / V_{g\ max} = 0,65$ and $\Delta_p = 200$ bar	n_{max}	min ⁻¹	4500	4200
Flow	at n_{max}	$q_{v\ max}$	L/min	375	498
Output power	$\Delta_p = 360$ bar	P_{max}	kW	225	299
Output torque	$\Delta_p = 360$ bar	T_{max}	Nm	619	951

Product dimensions*	(mm)	108	165
Splined shaft profile (internal splines)	DIN 5480 Tol. 9g	N35x2x16	N40x2x18
Centering diameter	A Tol. h8	215	240
Screw connecting diameter	B	**	**
Fastening bores	C	15	17
Splined shaft length	D	26.5	37.5
Insertion length	E	122	137
SAE flange connecting length	F	150	182
Overall length	G	312.5	374
Pressure ports	SAE (6000 psi)	1"	1 1/4"
Oil leakoff port		M26x1.5	M26x1.5

* Dimensions may vary according to configuration and additional equipment (installation drawing on request).

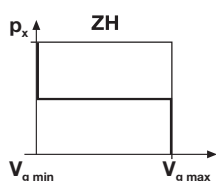
** 4-hole special attachment flange.

Note

This motor is mainly intended for installation in a mechanical travel drive (FAT).
Integrated brake valve, pressure relief valves and internal multi-disc brake.

Control / regulation

Hydraulic two-point control



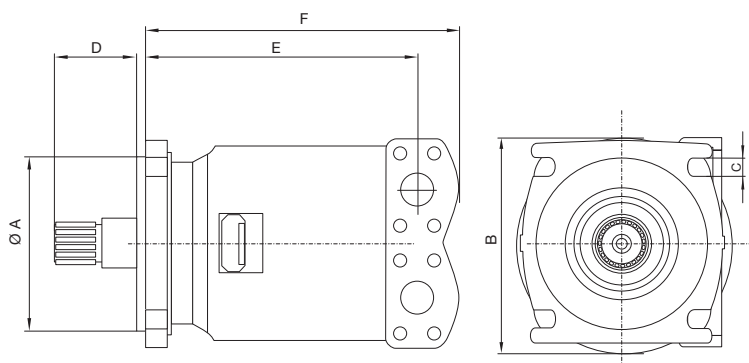
Type key for Series C hydraulic motors

		CMVE	O	/											
Motor type		Variable displacement plug-in motor, Series C		CMVE											
Circuit type		Open		O											
Nominal size		108	165												
Minimum displacement*															
V _{g min} = 65 (cm ³)		•	○	65											
V _{g min} = 79 (cm ³)		○	•	79											
V _{g min} = 97 (cm ³)		○	•	97											
* Other values on request															
Control / regulation		Hydraulic two-point control		•	•	ZH									
Version						1									
Direction of rotation (looking at input shaft)		right		-	-	R									
left		-	-	L											
alternating		•	•	W											
Mounting flange		Non-standard flange		•	•	51...									
Shaft end		Splined shaft DIN 5480		•	•	1									
Splined shaft SAE J744		○	○	2											
Connections		High pressure ports: SAE (6000 PSI)		•	•	A									
Oil leakage and control pressure ports: metric (DIN 3852)		•	•												
All ports: metric thread		○	○	B											
Additional equipment		No add-on equipment		○	○	0									
Multi-disc brake (integrated)		•	•	L											
Through-drive		Without through-drive		•	•	0									
Non-standard flange with through-drive		-	-	K											
Valve / sensor		none		○	○	00									
Flushing valve, closed circuit		-	-	SO											
Flushing valve, closed circuit with high pressure relief valve		-	-	SH											
Flushing valve, open circuit		○	○	MO											
Flushing valve, open circuit with high pressure relief valve		○	○	MH											
Resuction valve with high pressure relief valve		○	○	NH											
Resuction valve with hydraulically adjustable high pressure relief valve		○	○	NX											
Hydraulically adjustable high pressure relief valve		○	○	OX											
Brake valve + DBV		•	•	BH											
High pressure relief valve		○	○	DB											
Feed valve		-	-	NS											
Speed sensor		○	○	D											

- available
- on request
- not available

Series A: LMF motor (fixed displacement)

Open and closed circuit - Nominal pressure: 350 bar / Maximum pressure: 380 bar



Nominal size				107	125
Displacement		$V_{g\ max}$	cm ³	107	125.6
Max. speed	at $V_{g\ max}$ and $\Delta_p = 330$ bar	$n_{\ max}$	min ⁻¹	3540	3290
Flow	at $n_{\ max}$	$q_{v\ max}$	L/min	379	413
Output power	$\Delta_p = 330$ bar	$P_{\ max}$	kW	208	227
Output torque	$\Delta_p = 330$ bar	$T_{\ max}$	Nm	562	660

Product dimensions*	(mm)	107	125
Splined shaft profile	DIN 5480 tol. 9g	W40x2x18	W40x2x18
Centering diameter	A tol. h8	160	160
Screw connecting diameter	B	200	200
Fastening bores	C	18	18
Splined shaft length	D	45	45
SAE connection length	E	253.0	253.0
Overall length	F	292.0	292.0
Pressure ports	SAE (6000 psi)	1 1/4"	1 1/4"
Oil leakage port		R 3/4	R 3/4

* Dimensions may vary according to configuration and additional equipment (installation drawing on request).

Note

External brake valve can be attached to SAE port.

Type key for Series A hydraulic motors

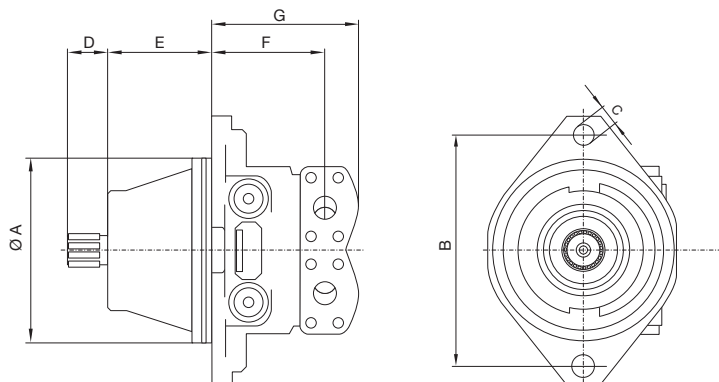
	LMF	/					
Motor type							
Fixed displacement motor, Series A	LMF						
Nominal size							
	107	125					
Version							
						1	
Control / regulation							
No regulator	•	•					00
Valves							
none	•	○					00
Flushing valve, closed circuit	○	○					SO
Flushing valve, closed circuit with high pressure relief valve	○	○					SH
Flushing valve, open circuit	○	○					MO
Flushing valve, open circuit with high pressure relief valve	○	○					MH
Resuction valve with high pressure relief valve	○	○					NH
Resuction valve with hydraulically adjustable high pressure relief valve	○	○					NX
External brake valve	○	•					BN
Mounting flange							
ISO 4-hole	•	•					6
Through-drive							
Without through-drive	•	•					00
Non-standard flange with through-drive	○	○					10
Additional function							
Speed sensor	○	○					D

- available
- on request
- not available

Series A: FMF plug-in motor (fixed displacement)

Open and closed circuit - Nominal pressure: 350 bar / Maximum pressure: 380 bar

On request up to nom. size 64 : Nominal pressure: 420 bar / Maximum pressure: 450 bar



Nominal size			25	28	32	45	58	64	90	100	125	165	250	
Displacement		$V_{g\ max}$	cm ³	25	28	31.8	45.6	58.3	64.3	90.7	103.2	125.7	165.9	256.8
Max. speed	at $V_{g\ max}$ and $\Delta_p = 330$ bar	$n_{\ max}$	min ⁻¹	5180	5180	5180	4620	4110	4110	3670	3540	3290	3000	2606
Flow	at $n_{\ max}$	$q_{v\ max}$	L/min	130	145	165	211	240	264	333	365	414	498	669
Output power	$\Delta_p = 330$ bar	$P_{\ max}$	kW	71	80	91	116	132	145	183	201	227	274	368
Output torque	$\Delta_p = 330$ bar	$T_{\ max}$	Nm	131	147	167	240	306	338	477	542	661	872	1349

Product dimensions*	(mm)	25	28	32	45	58	64	90	100	125	165	250
Splined shaft profile	DIN 5480 tol. 9g	W25x1.25x18	W25x1.25x18	W25x1.25x18	W30x2x14	W35x2x16	W35x2x16	W35x2x16	W40x2x18	W40x2x18	W45x2x21	W50x2x24
Centering diameter	A tol. h8	135	135	135	160	170	170	190	190	210	230	260
Screw connecting diameter	B	160	160	160	200	200	200	224	224	248	280	310
Fastening bores	C	13	13	13	18	17	17	21	21	21	26	26
Splined shaft length	D	30	30	30	35	40	40	40	45	45	50	55
Insertion length	E	88.5	88.5	88.5	92.3	92.3	92.3	110.5	110.5	122.8	130	145
SAE flange connecting length	F	179.5	179.5	179.5	192	215	215	234.5	234.5	265	285	309
Overall length	G	219.5	223.1	219.5	222	262	256	269.5	269.5	302	331	359
Pressure ports	SAE (6000 psi)	1/2"	1/2"	1/2"	3/4"	1"	3/4"ou 1"	1"	1"	1 1/4"	1 1/4"	1 1/4"
Oil leakage port		M16x1.5	M16x1.5	M16x1.5	M18x1.5	M18x1.5	M18x1.5	M26x1.5	R 3/4"	R 3/4"	M33x2	M33x2

* Dimensions may vary according to configuration and additional equipment (installation drawing on request).

Note

External brake valve can be attached to SAE union.

Type key for Series A hydraulic motors

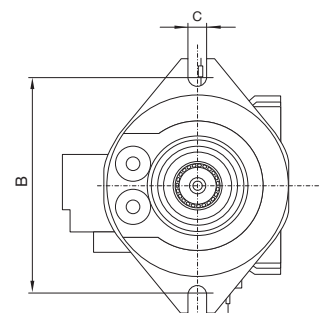
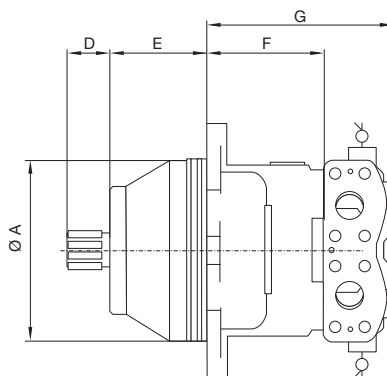
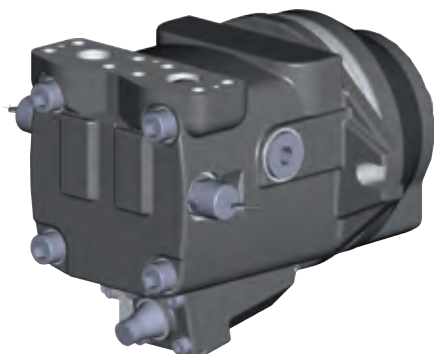
	25	28	32	45	58	64	90	100	125	165	250												
Motor type	Fixed displacement plug-in motor, Series A											FMF											
Nominal size																							
Version													1										
Control / regulation	No regulator												00										
Valves	none											•	•	○	•	○	○	○	○	○	00		
	Flushing valve, closed circuit											○	○	○	○	○	○	•	•	•	•	•	SO
	Flushing valve, closed circuit with high pressure relief valve											○	○	○	○	○	○	○	○	○	○	○	SH
	Flushing valve, open circuit											○	○	○	○	○	○	○	○	○	○	○	MO
	Flushing valve, open circuit with high pressure relief valve											○	○	○	○	○	○	○	○	○	○	○	MH
	Resuction valve with high pressure relief valve											•	○	•	•	•	•	•	○	○	○	○	NH
	Resuction valve with hydraulically adjustable high pressure relief valve											○	○	•	•	•	○	○	○	○	○	○	NX
	Hydraulically adjustable high pressure relief valve											○	○	○	○	○	○	○	○	○	○	○	OX
	External brake valve + DBV											○	○	○	○	○	○	○	○	○	○	○	BN
	Resuction valve with high pressure relief and damping valve											○	○	○	•	○	○	○	○	○	○	○	DV
Mounting flange																							
	2-hole flange											•	•	•	•	•	•	•	•	•	•	•	7
Through-drive	Without through-drive											•	•	•	•	•	•	•	•	•	•	•	00
	Non-standard flange with through-drive											-	-	-	-	-	-	-	-	-	-	-	10
Additional function	Speed sensor											○	○	○	○	•	•	•	•	•	•	•	D

- available
- on request
- not available

Series A: FMV variable displacement plug-in motor (open circuit)

Nominal pressure: 350 bar / Maximum pressure: 380 bar

On request up to nom. size 75 : Nominal pressure: 420 bar / Maximum pressure: 450 bar



Nominal size			75	100	140	165	250	
Displacement		V_g	cm ³	75	103.1	141.2	165.8	256.8
Max. speed	at $V_{g\max}$ and $\Delta_p = 330$ bar	n_{\max}	min ⁻¹	3900	3540	3160	3000	2600
Max. speed	at $V_g/V_{g\max} = 0,65$ and $\Delta_p = 200$ bar	n_{\max}	min ⁻¹	5460	4950	4420	4200	3640
Flow	at n_{\max}	$q_{v\max}$	L/min	293	365	446	497	668
Output power	$\Delta_p = 330$ bar	P_{\max}	kW	161	201	245	274	367
Output torque	$\Delta_p = 330$ bar	T_{\max}	Nm	394	542	742	871	1349

Product dimensions*	(mm)	75	100	140	165	250
Splined shaft profile (internal splines)	DIN 5480 tol. 9H	W35x2x16	W35x2x16	W40x2x18	W45x2x21	W50x2x24
Centering diameter	A tol. h8	170	190	210	230	260
Screw connecting diameter	B	202	224	250	280	310
Fastening bores	C	17	21	22	26	26
Splined shaft length	D	40	40	45	50	63
Insertion length	E	92.3	110.5	123	130	137
SAE flange connecting length	F	134.2	140	155	174	188
Overall length	G	175.2	188.5	199	220	238
Pressure ports	SAE (6000 psi)	1"	1"	1 1/4"	1 1/4"	1 1/4"
Oil leakage port		M26x1.5	R 3/4"	R 3/4"	M33x2	M33x2

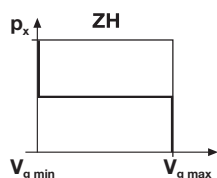
* Dimensions may vary according to configuration and additional equipment (installation drawing on request)

Note

This motor is mainly intended for installation in a mechanical travel drive (FAT).
External brake valve can be attached to SAE port.

Control / regulation

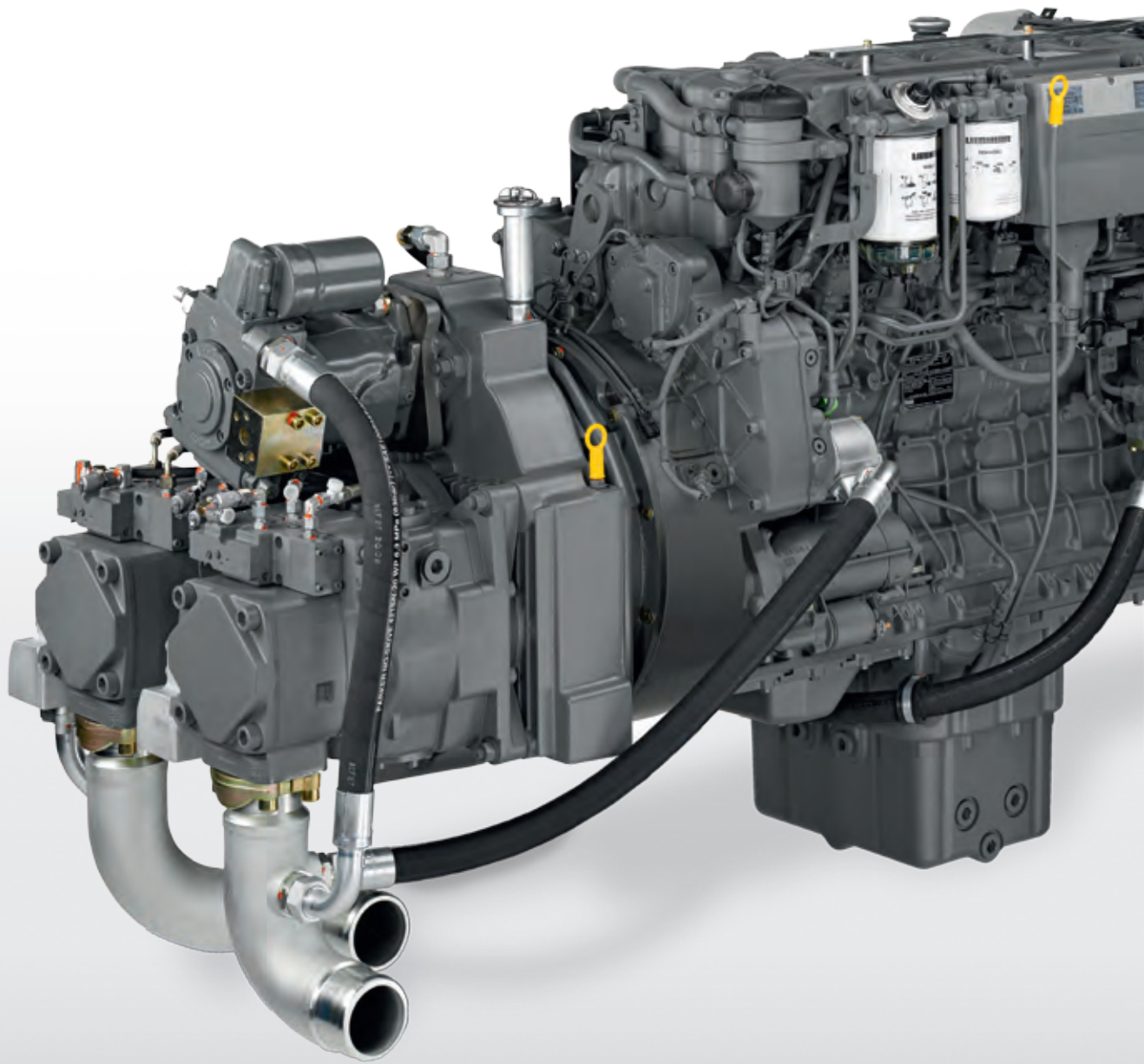
Hydraulic two-point control



Type key for Series A hydraulic motors

		FMV	/						
Motor type	Variable displacement plug-in motor, Series A	FMV							
Nominal size		75	100	140	165	250			
Version									1
Control / regulation	No regulator	-	-	-	-	-			00
	Hydraulic two-point control	•	•	•	•	•			2D
Valves	none	○	○	○	○	○			00
	Flushing valve, closed circuit	○	○	○	○	○			SO
	Flushing valve, closed circuit with high pressure relief valve	○	○	○	○	○			SH
	Flushing valve, open circuit	○	○	○	○	○	•		MO
	Flushing valve, open circuit with high pressure relief valve	○	○	○	○	○			MH
	External brake valve with high pressure relief valve	•	•	•	•	•			BH
Mounting flange	2-hole flange	•	•	•	•	•			7
Through-drive	Without through-drive	•	•	•	•	•			00
	Non-standard flange with through-drive	-	-	-	-	-			10
Minimum displacement	$V_{g \min} = 33$ (cm ³ /tr)	•	-	-	-	-			33
	$V_{g \min} = 44$ (cm ³ /tr)	•	-	-	-	-			44
	$V_{g \min} = 56$ (cm ³ /tr)	-	•	-	-	-			56
	$V_{g \min} = 63.5$ (cm ³ /tr)	-	•	-	-	-			63.5
	$V_{g \min} = 89$ (cm ³ /tr)	-	-	•	-	-			89
	$V_{g \min} = 101$ (cm ³ /tr)	-	-	•	-	-			101
	$V_{g \min} = 110$ (cm ³ /tr)	-	-	-	-	•			110
	$V_{g \min} = 117$ (cm ³ /tr)	-	-	-	-	•			117
	$V_{g \min} = 140$ (cm ³ /tr)	-	-	-	-	•			140
	$V_{g \min} = 160$ (cm ³ /tr)	-	-	-	-	•			160
	$V_{g \min} = 202$ (cm ³ /tr)	-	-	-	-	•			202
Additional function	Speed sensor	○	○	○	○	○			D

- available
- on request
- not available



Multi-circuit unit

MKA 450 D
 Power rating 504 kW
 3 axial piston pumps
 250 cc/rev
 1 axial piston pump
 75 cc/rev



Pilot control units

Hand and foot operated hydraulic pilot control units

Example of a drive train assembly



AG936

270 kW (1.500 - 1.800 U/min)

- 1 multi-output pump splitter box
- 2 pumps in open circuit
- 1 pump in closed circuit
- 1 low-pressure pump
- 1 gear-type pump



Multi-circuit unit

MKA 450 C

Power rating 360 kW

2 axial piston pumps

250 cc/rev

One output not in use

Liebherr-Component Technologies

Liebherr-Component Technologies AG, with headquarter in Bulle, Switzerland, is responsible for all activities involving the components sector within the Liebherr Group. The companies and corporate units belonging to this sector are specialized in the development, design, manufacture and reconditioning of high performance components in the field of mechanical, hydraulic, and electrical drive as well as control technology.

Long Years of Experience

Liebherr has decades of experience in the field of top quality components, for use in cranes, construction machinery, in the mining industry, maritime applications, wind turbines, automotive engineering, the aerospace sector, and in transport technology. Synergy effects from the other product sectors of the Liebherr Group of Companies are put to rational use in driving ahead with constant technological further development.

The Right Solution for Every Need

Thanks to the in-depth manufacturing techniques and the use of the most modern and flexible production resources, Liebherr can provide customers with tailor-made solutions. Every component is developed to meet individual wishes and requirements. Liebherr is your partner for achieving success together, from the product idea to development, manufacture, and taking into service, and right on up to series manufacture. For the mechanical and hydraulic drive train components Liebherr offers reconditioning in different stages from a specialised works.

System Solutions from One Source

Components from Liebherr are perfectly matched to one another in their functional performance, and in combination they achieve maximum total levels of effect and efficiency. Depending on the requirement, individual components from the broad product selection can be extended up to the complete drive train. This creates system solutions with real conviction, which can be integrated into a whole range of applications.

Quality and Cutting Edge Technologies

All components meet the highest demands for functional reliability and long service life, even under the toughest conditions. A refined quality management and extensive inspection and testing procedures are applied throughout the entire development and manufacturing process. So they ensure the reliability and long life of the components. Highly qualified staff with a real sense of responsibility plays their part in achieving the fine Liebherr quality standard.

www.liebherr.com



Biberach: large diameter bearings, gearboxes, control technology



Lindau: electronics



Kirchdorf: hydraulic cylinders



Bulle: diesel engines, splitter boxes, hydraulics



Ettlingen: exchange components



Monterrey: large diameter bearings